TECHNICAL MANUAL

DEPARTMENT OF THE ARMY
TECHNICAL MANUAL
OPERATOR'S ORGANIZATIONAL, DIRECT SUPPORT, AND GENERAL SUPPORT MAINTENANCE MANUAL

TEST SET, RELAY TS-1775/U

NSN 6625-00-064-6096

HEADQUARTERS, DEPARTMENT OF THE ARMY

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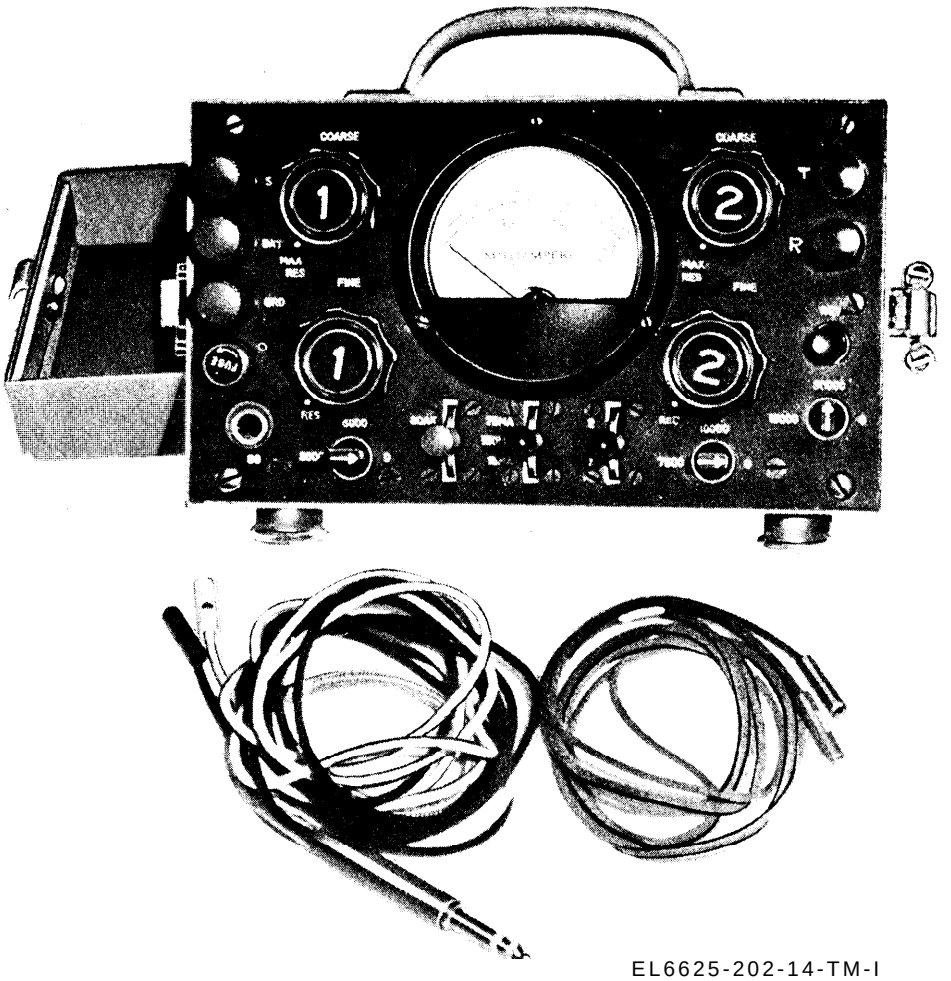
l This manual supersedes TM 11-6625-202-10, 22 August 1958 including all changes; TM 11-6625-202-20, 15 August 1958 including all changes, and TM 11-6625-202-35, 24 November 1958.

LIST OF ILLUSTRATIONS



EL6625-202-14-TM-I

Figure 1-1. Test Set, Relay TS-1775/U.

CHAPTER 1

INTRODUCTION

Section I. GENERAL

1-1. Scope

a. This manual describes Test Set, Relay TS-1775/U (fig. 1-1) and provides instructions for operation, organizational maintenance, general support (GS) maintenance. No direct support is authorized for this equipment. Instructions are provided for the operator and organizational repairman for installation, operation, preventive maintenance, and replacement of parts available at organizational maintenance. Circuit functioning is included for general support maintenance, together with instructions appropriate to these categories of maintenance for troubleshooting, testing, adjusting aligning, and repairing the equipment and replacing maintenance parts.

b. Appendix C is current as of September 1975.

-2. Indexes of Equipment 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.

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 (Packaging Improvement Report) as prescribed in AR 700-58/NAVSUPINST 4030.29/AFR 71-13/MCO P4030.29A, and DSAR 4145.8.

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/NAVSUPINST 4610.33A/AFR 75-18/MCO P4610.19B and DSAR 4500.15.

1-4. Recommendation for Equipment Publication Improvements

The 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 Publications and Blank Forms) or DA Form 2028-2 (Test) located in the back of the manual, and forwarded direct to Commander, US Army Electronics Command, ATTN: AMSEL-MA-Q, Fort Monmouth, NJ 07703. To use the form in the back of the manual, cut it out, fill it out as shown on the sample figure 1-2, fold it where shown, and drop it in the mail. A reply will be furnished direct to you.

1-5. Administrative Storage

For procedures, forms, and records, and inspections required during administrative storage of this equipment, refer to TM 740-90-1.

1-6. Destruction of Army Materiel

Demolition and destruction of electronic equipment will be under the direction of the commander and in accordance with TM 750-244-2 .

Section II. DESCRIPTION AND DATA

-7. Description and Use

a. Test Set, Relay TS-1775/U is a transportable, current-flow type, relay test set. It is used to measure and regulate the value of direct current (dc) applied to the winding of a relay, drop, or similar electromagnetic device, for test or adjustment purposes. The test set is primarily used to test the performance of telephone and teletypewriter equipment relays, It can also be used as a dc milliammeter.

b. The test set meter and controls are assembled on a panel within a metal case. The case is equipped with cushioned feet, a carrying handle, and a removable cover that is secured by latches. Four single-conductor and one two. conductor test cord assemblies are provided (para

1-6). The single-conductor test cords are terminated at each end with a socket type connector.. The two -conductor test cord is terminated at one end by a telephone type plug and at the other end by two socket type connectors.

c. When station battery is unavailable, a dry cell battery (such as 22% -volt or 45-volt dry cell battery) is required to provide power for the test set when checking relays.

1-8. Technical Characteristics

Type of relay tests that can be made . . . . Operate
Nonoperate
Hold
Release

Types of relays that can be tested . . . . . Neutral
Polar

Teat current :
Source . . . . . External
Range . . . . . Adjustable, 0 to 150 ma.

Milliammeter:
Type
Scales . . . . . 0 to ll5 ma
0 to 76 ma
0 to 160 ma
Accuracy . . . . . ± 2 percent scale
Sentivity . . . . . .5 ma

Fuse . . . . . 1/8 amp, 125-volt

1-9. Items Comprising An Operable Equipment

Refer to table 1-1 for items comprising an operable Test Sat, Relay TS-1775/U.

Table 1-1. Items Comprising An Operable Test Set, Relay TS-1776/U

			Dimensions			
Qty	NSN	*Item*	*Height*	*Depth*	*Width*	Weight
1	6625-00-064-6069	Test Set, Relay TS-1775/U	5-1/8	6-1/8	8-3/4	(lbs) 9
4		Test Cord Assy dwg No. SM-B-55377	6 feet long			
1		Test Cord Assy dwg No. *SM-B-55378*	6-1/2 long			

RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL MANUALS

SOMETHING WRONG WITH THIS MANUAL?

THEN. . .JOT DOWN THE DOPE ABOUT IT ON THIS FORM, TEAR IT OUT, FOLD IT AND DROP IT IN THE MAIL!

FROM: (YOUR UNIT'S COMPLETE ADDRESS)
Commander
Stateside Army Depot
ATTN: AMSTA-US
Stateside, N.J. 07703

DATE 10 July 1975

PUBLICATION NUMBER	DATE	TITLE
TM 11-5840-340-12	23 Jan 74	Radar Set AN/APC-76

BE EXACT. . .PIN-POINT WHERE IT IS				IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:
PAGE NO.	PARAGRAPH	FIGURE NO.	TABLE NO.	
2-25	2-28			Recommend that the installation antenna alignment procedure be changed throughout to specify a 2° IFF antenna lag rather than 1°. REASON: Experience has shown that with only a 1° lag, the antenna servo system is too sensitive to wind gusting in excess of [illegible] knots, and has a tendency to rapidly accelerate and decelerate as it hunts, causing strain to the drive train. Hunting is minimized by adjusting the lag to 2° without degradation of operation.
3-10	3-3		3-1	Item 5, Function column. Change "2 db" to "3db." REASON: The adjustment procedure for the TRANS POWER FAULT indicator calls for a 3 db (500 watts) adjustment to light the TRANS POWER FAULT indicator.
5-6	5-8			Add new step f.1 to read, "Replace cover plate removed in step e.1, above." REASON: To replace the cover plate.
		F03		Zone C 3. On J1-2, change "+24 VDC to "+5 VDC." REASON: This is the output line of the 5 VDC power supply. + 24 VDC is the input voltage.

TYPED NAME, GRADE OR TITLE, AND TELEPHONE NUMBER
SSG I. M. DeSpiritof 999-1776

SIGN HERE: SSG I. M. DeSpiritof

DA FORM 1 AUG 74 2028-2 (TEST)

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

TEAR ALONG DOTTED LINE

EL6625-202-14-TM-16

Figure 1-2. Sample DA Form 2028-2 (test).

CHAPTER2

SERVICE UPON RECEIPT AND INSTALLATION

2-1. unpacking

a ***Packaging Data.*** W hen packed for shipment, Test Set, Relay **TS-1775/U is** placed in a waterproof carton and packed in a corrugated cardboard box. A typical packing case and its contents are shown in figure 2-1.

b. Removing Contents. Perform all the procedure in (1) through (4) below when unpacking equipment.

(1) Open the outer corrugated carton and moistureproof barrier.

(2) Remove the inner carton.

(3) Open the inner corrugated carton.

(4) Remove the voltmeter.

2.2. Checking Unpacked Equipment

a. Inspect the equipment for damage incurred during shipment.

b. Check to see that the equipment is complete (see paragraph 1-6). Report all discrepancies in accordance with TM 38-750. Shortage of a minor assembly or part that does not affect proper functioning of the equipment should not prevent use of the equipment.

c. If the equipment has been used or reconditioned, see whether it has been changed by a modification work order (MWO). If the equipment has been modified, the M WO number will appear on the side near the nomenclature. Check to see whether the MWO number (if any) end appropriate notations concerning the modification have been entered in the equipment manual.

NOTE

Current MWO's applicable to the equipment are listed in DA Pam 310-7.

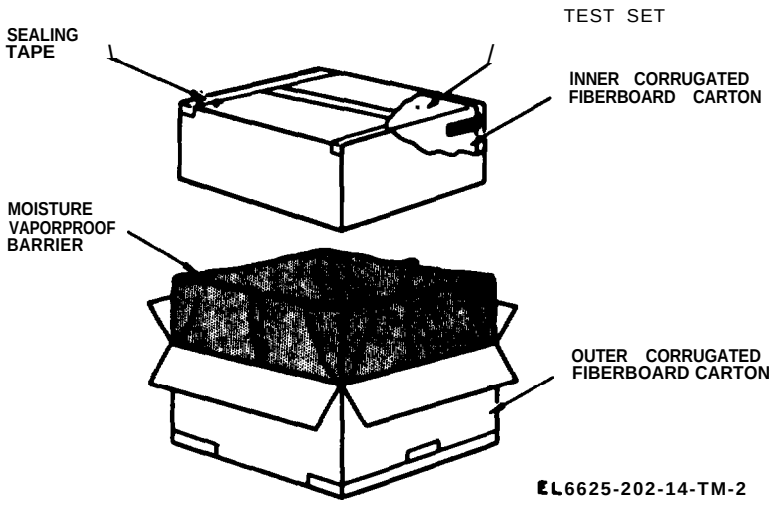


Figure 2-1. Typical packaging diagram.

2-3. Cable Connections

a. If the single conductor test cords are used, insert a pin type spade terminal into one end of each test cord and then connect the test cords to the appropriate binding poets for the test to be made.

b. If the two conductor test cord is to be used, insert the test cord plug into the BG jack on the front panel.

NOTE

The tip and ring conductors of the two conductor test cord are color coded on one end. The tip conductor is coded white; the ring conductor black.

CHAPTER 3

OPERATING INSTRUCTIONS

SECTION I. CONTROLS AND INSTRUMENTS

3-1. General

This chapter should be read carefully before using the test set. It contains information necessary for proper operation of the test set. To achieve valid readings, proper switch settings are required. Controls and indicators, with the function of each, are listed in paragraph 3-9. Operating procedures are described in 3-4 to 3-11. The controls are shown in figure 3-1.

3-2. Precautions for Setting Controls

When setting controls, obesrve the following precautions to prevent damage to the mlliammeter.

a Always place the 75MA-150MA-l5MA switch in the l5OMA position before starting **to** adjust the current value for a test. Do not reposition the switch to select another meter scale, unless the meter indicates that circuit current is less than ***a*** full-scale ***reading*** for the scale that is to be used.

b. When the current in the circuit is to be increased by means of the twist switches, return the 75MA-150MA-15MA switch to the 150MA position before increasing the current.

c. Always start to adjust circuit current with maximun resistance in the circuit.

(1) Turn both COARSE and both FINE control knobs fully counterclockwise (ccw) (to MAX RES position) and position the three twist switches so that their indicating arrows point upward, to the largest numbers (maximum resistance) .

(2) To obtain the circuit current required, reduce the *resistance gradually* ***so*** that there will not be a sharp increase in current which may exceed the maximum full-scale capacity (150 ma) ***of the*** milliameter.

3-3. Controls and Indicators

The test set controls are on the front panel. Their functions are described in table 3-1 below.

Table 3-1. Operating and Controls Indicators

Control or indicator	***Function***
COARSE l rheostat	**Provides coarse adjusment of current in No. l circuit**
FINE l rheostat	**Provides fine adjustment of current No.1 circuit**
3000-6000-0 twist switch	**Provides coarse adjustment (2 Steps) of the current No. 1 circuit.**
SOAK-1 switch	**Three-position switch; in the up (SOAK) *position (nonlocking),* Closes the soak circuit in the down (l)position (nonlocking), closes No. 1 circuit; in the center(normal, locking) position both circuit open.**
COARSE 2 rheostat	**Provides coarse adjustmen of current in No.2 circuit**
FINE 2 rheostat	**Provides fine adjustment of current No. 2 circuit.**
7500-15000-0 twist switch	**Provides coarse adjustment (2 steps) of the *current in No.* 2 circuit.**
15000-30000-0 twist switch	**Provides coarse adjustment (2steps) of the current No. 2 circuit.**
2-2 switch	**Three-position switch; in either the up (locking) or down (nonlocking) position. closes no. 2 circuit. *In the center (normal, locking) position No. 2* is is *open.***
75MA-150MA-15MA switch	***Permits selection of the desired scale of milliammeter. The switch is locking in the* 75MA and 150MA positions; nonlocking in the 15MA position.**
REV switch	**Two-position switch (in or out) which reverse the current flow at the T (tip) and R ring) binding posts.**
MILLIAMPERES *meter*	**Indicates current being applied to equipment under test.**

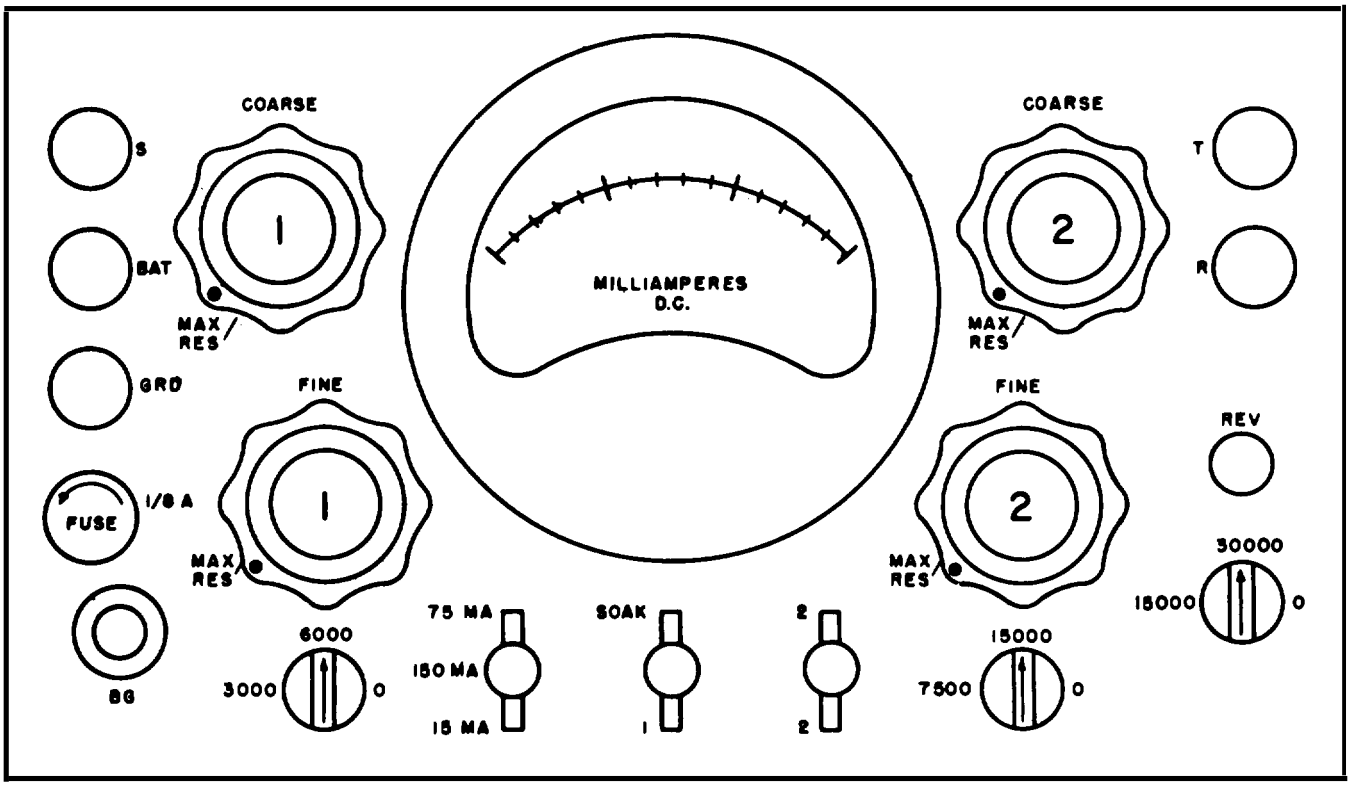


Figure 3-1. Controls and Indicators.

Section II. OPERATION UNDER USUAL CONDITIONS

3-4. Operating Procedures

Before a relay is tested; preliminary preparation of the test set and of the relay circuit is usually necessary. *For example,* the test set may have to be connected in a particular way and at a particular point in the circuit, other relays in the circuit may have to be blocked (either operated or unoperated), and some switches in the circuit may have to be positioned in a specific manner. In. formation covering circuit requirements and adjustment data for relays under test are usually provided in a table in the maintenance portion of the technical literature provided for the equipment containing the relays. A typical table is shown below.

Table 8-2. Relay Adjustment Data Trunk Circuit Relays

Relay	*Block or* **insulate**	*Test set prepar.*	*Test point*	*Teat winding*	*Test for*	**Readjust** *ma*	*Test ma*	**Remarks**
DL	**DL(1,2)**	**B/G**	**DL(A)**	**A-B**	**o**	**14**	**15**	**Refer to pare 00 for spring gaging data.**
					NO	**11**	**9.5**	
CO	**CO(24,25) CO(21,22)**	**GRD**	**CO(D)**	**C-D**	**o**	**20**	**22**	**Operate transfer switch.**
					NO	**16.5**	**15**	
LR	**LR(5,6)**	**B/G**	**LR(2)**	**B-D**	**o**	**8.2**	**8.7**	**X contacts only.**
			LR(D)		**NO**	**6.7**	**6.2**	**X contacts only.**
					o	**16**	**17.5**	**Bat. on contact 6.**
					NO	**13**	**11.5**	

i3-5. **Relay Test Connections**

a *General* Connections between the test set and the relay under test are determined by the relay circuitry. Relay adjustment tables usually specify one of the following types of test connections:

(1) B/G (battery-ground).
(2) BAT (battery).
(3) GRD (ground).
(4) M (metallic).
(5) NGB (nongrounded battery).

b. B/G *(Battery-Ground) Test Connections.* When both station battery and ground must be applied to the relay under test, connect the test cords as shown in either A or B of figure **3-2.**

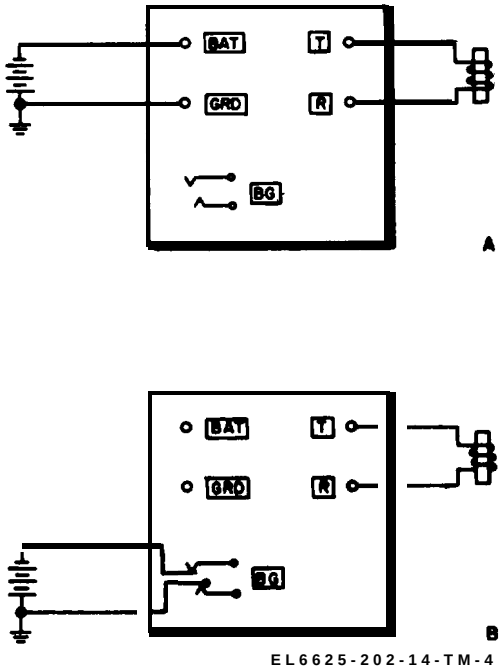


FIGURE 3-2. B/G (battery ground test connections.

c. BAT (battery) Test Connections. When grounded battery must be applied to the relay under test, connect the test cords as shown in figure **3-3.**

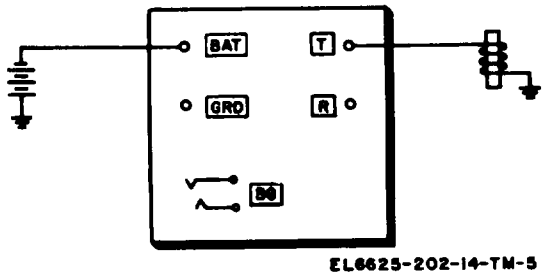


Figure 3-3. BAT (battery) test connections.

d. *GRD (ground) Test Connections.* When station ground must be applied to the relay under test, connect the test cords as shown in figure **3-4.**

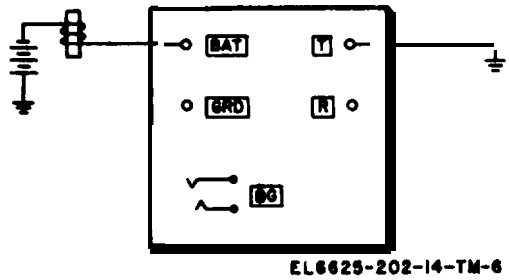


Figure 3-4. GRD (ground) test connections.

e. M (metallic) *Test Connections.* When a relay has at least two windings, one of which is connected to battery and the other to ground, connect the test cords and the strap as shown in either A or B of figure **3-5.**

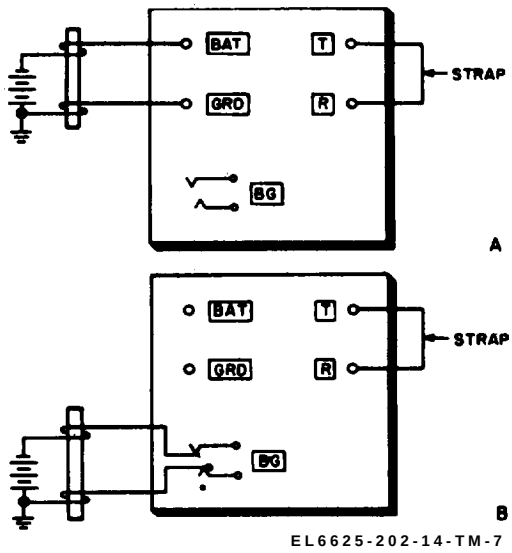


Figure 3-5. M (metallic) *test connections.*

f. NGB (nongrounded battery) Test Connections. When nongrounded battery must be applied to the relay under teat, connect the teat set as shown in figure 3-6.

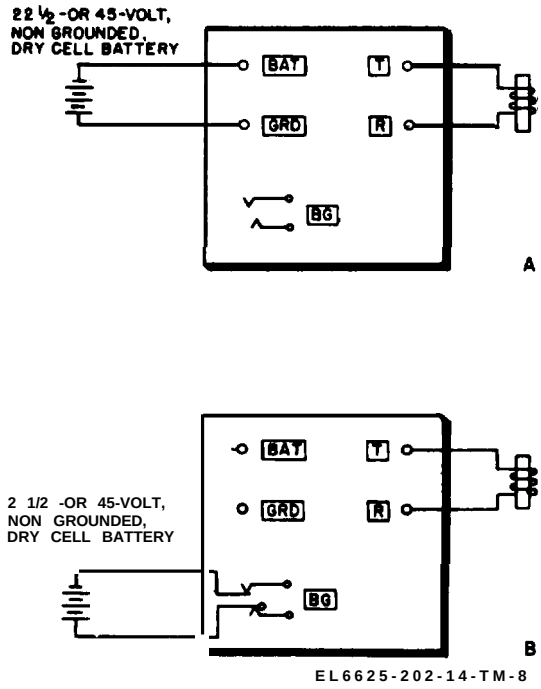


Figure 3-6. NGB (nongrounded battery) test connections.

3-6. Relay Performance Requirements

a. Operate *Requirement.* To meet an operate requirement, the armature of the relay under test must move sufficiently from its unoperated position to cause all normally open contacts to close and all normally closed contacts to open.

b. Nonoperate Requirement. To meet a nonoperate requirement, the armature of the relay under test must not move from its unoperated position, or must not move enough to closed open contacts or to cause closed contacts to open.

c. *Hold Requirement.* To meet a hold requirement, the armature of the relay under test must not move from its operated position above when the applied current is reduced abruptly to a specified hold value.

d. Release Requirement. To meet a release requirement, the armature of the relay under test must move to its unoperated position when the applied current is reduced to a specified release value, without interruption of the current.

e. *SOAK Requirement.* In some types of relays, a definite magnetic condition of the core must be established before the performance of the relay is tested. To obtain this magnetic condition, a comparatively heavy current or soak current is applied to the winding of such a relay immediately before the relay is tested for performance. For most types of relays, the unadjustable soak current that is furnished by the test set soak circuit is satisfactory. For some relays, the relationship between the magnitude of the soak current and the magnitude of the operating current is critical so that the No. 1 circuit of the test set should be used to provide adjustable soak current.

3-7. Adjustment of Relay Test Current

Relay test currents, of specific magnitudes, can be established in either the No. 1 circuit or the No. 2 circuit of the test set.

a. No. 1 Circuit. To establish the required teat current in the No. 1 circuit:

(1) Set the 75MA-15OMA-15MA switch to position 150MA (fig. 3.1).

(2) Depress the REV switch.

(3) Depress and hold the SOAK-1 switch to position 1.

(4) Adjust the following controls (para 3-2,3-3) until the required current value is indicated on the milliammeter.

(a) 3000 -6000-0 twist switch.

(b) COARSE 1 rheostat.

(c) FINE 1 rheostat.

(5) Change the position of the 75MA-150 MA-15MA switch as required, during adjustment.

(6) Release the SOAK-1 switch.

b. No. 2 *Circuit.* To establish the required relay test current in the No. 2 circuit.

(1) Set the 75MA-150MA-15MA switch to position 150MA.

(2) Depress the REV switch.

(3) Depress and hold the 2-2 switch to position 2 (down).

(4) Adjust the following controls until the required current value is indicated on the milliammeter.

(a) 16000-30000-0 switch.

(b) 7500 -15000-0 switch.

(c) COARSE 2 rheostat.

(d) FINE 2 rheostat.

(5) Change the position of the 75MA-l5OMA-150MA switch as required, during adjustment.

(6) Release the 2-2 switch.

3-6. Operate (0) and Nonoperate (NO) Relay Test Procedure

NOTES

1. If a soak requirement is not specified in the relay adjustment data, use teat procedures *a* or *b*.
2. If a soak requirement is specified and the value of the soak current is not indicated use test procedure *c* or *d*. If soak current is specified use test procedure e.
3. The maximum resistance in No. 2 circuit is greater than in No. 1 circuit; therefore, smaller magnitudes of current may be established in the No. 2 circuit.

a. Operate and Nonoperate Relay Test Using No. 1 Circuit.

(1) Establish *the operate* **current in No.** 1 circuit (para 3-7).

(2) Observe the relay to see if it meets its operate requirement (para 3-6) when the SOAK-1 switch is in position 1.

(3) Observe the *relay to see if* it meets its nonoperate requirement (para 3-6) when the 2-2 switch is operated to position 2 (down).

b. Operate and Nonoperate Relay Test Using No. 2 Circuit.

(1) Establish the operate current in No, 2 circuit (para 3-7).

(2) Observe the relay to see if it meets its operate requirement (para 3-6) when the 2-2 switch is operated to position 2 (down).

(3) Observe the relay to see if it meets its nonoperate requirement (para 3-6) when the 2-2 switch is placed in its center position,

c. *Operate and Nonoperate Relay Test* **Using No.** *1 Circuit and Soak Circuit.*

(1) Establish the operate current in No. 1 circuit (para 3-7),

(2) Operate the SOAK-1 switch to the SOAK position for one or two seconds, to fulfill the soak requirement of the relay (pare 3-6), and then operate the SOAK-1 switch to position 1.

(3) Observe the relay to see if it meets its operate requirement (para 3-6).

d. Operate and Nonoperate Relay Test Using No. 2 Circuit and Soak Circuit.

(1) Establish the operate current in No. 2 circuit (para 3-7).

(2) Operate the SOAK-1 switch to the SOAK position for one **or** two seconds, to fulfill the soak requirement of the relay (para 3-6), and then release the SOAK-1 switch.

(3) Operate the 2-2 switch to position 2 (down) as soon as the SOAK-1 switch is released.

(4) Observe the relay to see if it meets its operate requirement (para 3-6).

e. *Operate and Nonoperate Relay Test Using No, 1 Circuit and No. 2 Circuit.*

(1) Establish the operate current in No. 2 circuit (para 3-7).

(2) Establish the soak current in No. 1 circuit (para 3-7).

(3) Operate SOAK-1 switch to position 1 for one or two seconds, to fulfill the soak requirement of the relay (para 3-6), and then release the SOAK-1 switch.

(4) Operate the 2-2 switch to position 2 (down) as soon as the SOAK-1 switch is released.

(5) Observe the *relay to see if* it meets its operate requirement (para 3-6).

3-9. **Hold (H) Relay Test Procedures**

NOTE

If **a specific value of** operate or soak current is specified in the relay adjustment data, use test procedure *a;* if current is not specified, use *b.*

a. Hold(H) Test Using No. 1 Circuit and No. 2 Circuit.

{1) Establish the hold current in No. 2 circuit (para 3-7).

(2) Operate the 2-2 switch to position 2 (up).

(3) Establish the operate current or soak current in No. 1 circuit.

(4) Operate the SOAK-1 switch to position 1 for one or two seconds, to operate the relay, and then release the SOAK-1 switch.

(5) Observe the relay to see if it meets its hold requirement (para 3-6).

b. Hold(H) Test Using No. 2 *Circuit and Soak* Circuit.

(1) Establish the hold current in No, 2 circuit (para 3-7).

(2) Operate the **2-2** switch to position 2 (up).

(3) Operate the SOAK-1 switch to the SOAK position for one or two seconds, to operate the relay, and then release the SOAK-1 switch.

(4) Observe the relay to see if it meets its **hold** requirement (para 3-6).

3-10. Release (R) Relay Test Procedure

NOTE

If **a** specific value of operate or soak current is specified in the relay adjustment data, use test procedure a; if current is not specified, use *b.* "

a. Release (R) Test Using No, 1 Circuit and No. 2 *Circuit.*

(1) Establish the release current in No. 2 circuit (para 3-7).

(2) Operate the *2-2 switch to* position 2 (up).

(3) Establish the operate current of soak current in No. 1 circuit (para *3-7).*

(4) Operate the SOAK-1 switch to position 1 for one or two seconds, to operate the relay, and then release the SOAK-1 switch.

(5) Observe the relay to see if it meets its release requirement (para 3-6).

b. Release (R) Test Using No. 2 Circuit and Soak Circuit.

(1) Establish the release current in No, 2 circuit (para 3-7).

(2) Operate the 2-2 switch to position 2 (up).

(3) Operate the SOAK-1 switch to the SOAK position for one or two seconds, to operate the relay, and then release the SOAK- 1 switch.

(4) Observe the relay to see if it meets its *release* requirement (para 3-6).

3-11, Use of the TS-1775/ U as a Milliammeter

a. General. When the TS-1775/U is used as a milliammeter, the internal resistance of the test set circuitry is about 9 ohms for the 150 ma range, about 10 ohms for the 75 ma range, and about 15 ohms for the 15 ma range. These resistance values include the resistance of the milliammeter and the fuse; the resistance of the fuse is approximately 7.9 ohms.

b. Adjustments, Connections, and Operation.

(1) Turn the COARSE 2 rheostat to its extreme cw position.

(2) Turn the FINE 2 rheostat to its extreme cw position.

(3) Operate the 7500 -15000.0 switch to position O.

(4) Operate the 15000-30000-0 switch to position O.

(5) Operate 75 MA-150MA-15MA switch to the appropriate position for the magnitude of current to be measured.

CAUTION

When the approximate magnitude of the current in the circuit under teat is unknown, always operate the 75MA-150MA-15MA switch to the 150MA position initially, to prevent damage to the meter. Reposition the switch only after the connections have been made and the meter indicates that the magnitude of the current under test is less than a full-scale reading for one of the lower scales (75MA or 15 MA) on the meter.

(6) Strap binding posts T and R together.

(7) Connect the circuit under test to the BAT and GRD binding posts, or to jack BG.

(8) Operate the 2-2 switch to position 2 (either up or down) and read the meter.

CHAPTER 4

OPERATOR / CREW AND ORGANIZATIONAL MAINTENANCE INSTRUCTIONS

Section 1. OPERATOR AND ORGANIZATIONAL TOOLS AND EQUIPMENT

4-1. Common Tools and Equipment

Tools and test equipment used by the operator and organizational repairman for the test set are listed in appendix C.

4-2. Special Tools and Equipment

No special tools are required for maintenance.

4-3. Lubrication Instructions

No lubrication instructions are required.

Section IL PREVENTIVE MAINTENANCE CHECKS AND SERVICES

4-4. General

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. The necessary preventive maintenance checks and services to be performed are listed and described in tables 4.1, 4-2, and 4-3. Item numbers indicate the sequence of minimum inspection requirements. Defects discovered during operation of the unit will be noted for future correction, to be made as soon as operation has ceased. Operation shall be stopped immediately if a deficiency is noted which would damage the equipment. Record all deficiencies together with corrective action taken as prescribed in TM 38-750.

4-5. Scope of Operator/ Crew Maintenance

The maintenance duties assigned to the operator/crew for the test set are listed below.

a. Daily preventive maintenance checks and services (table 4-l).

b. Weekly preventive maintenance checks and services (table 4-1).

c. Cleaning (para 4-8).

4-6. Systematic Care

The procedures given in tables 4-1 through 4-3, along with paragraphs 4-8 and 4-9, cover routine systematic care and cleaning essential to proper upkeep of this equipment when it is used separately. When this equipment is used as part of a set or system, follow the procedures established in the set or system manual.

4-7. Preventive Maintenance Checks and Services Periods

preventive maintenance checks and services of the test set are required daily, weekly, monthly, and quarterly.

a. Table 4-1 specifies checks and services that must be accomplished daily and under the special conditions listed below:

(1) At least once each week if the equipment is maintained in standby condition.

(2) When the equipment is initially installed.

(3) When the equipment is reinstalled after removal for any reason.

b. Tables 4-1 and 4-2 specify additional checks and services that must be performed a weekly, monthly, and quarterly basis, respectively.

c. To assist in maintaining combat serviceability y, the tables indicate what to check, how to check, and what normal conditions are. References included are to illustrations, paragraphs, or manuals that contain detailed repair or replacement procedures. If the defect cannot be remedied by performing the corrective actions indicated, higher maintenance category repair is required

Table 4-1. Operator/Crew Preventive Maintenance Checks and Services

D-Daily
Time Required: **0.2**

W—Weekly
Time Required:

Interval and sequence No.		*Item to be inspected procedure*	Work time (M/H)
D	w		
1		EXPOSED ITEMS: Clean exposed surfaces of case and control panel (para 4-8).	0.1
2		CONTROLS: Check that mechanical action of each knob, switch, and control is smooth and free of binding and no excessive looseness is apparent.	0.1

Table 4-1. Operator/Crew Preventive Maintenance Checks and Services-Continued

D-Daily
Time Required **0.45**

W–Weekly
Time Required

Interval and sequence No.		*Item to be inspected procedure*	*work time (M/H)*
D	*W*		
	1	POWER CORD: Inspect cord for chafed, cracked, or frayed insulation. Replace cord that is stripped or worn excessively.	0.05
	2	HARDWARE: Inspect all exterior hardware for looseness and damage. All screws must be tight and not damaged.	0.05
	3	METAL SURFACES: Inspect exposed metal surfaces for rust and corrosion. Clean and touch up paint as required (para 4-10).	0.05
	4	OPERATION: Perform operating procedures given in paragraph 3-7.	0.2
	s	CONNECTORS: Inspect connectors for snug fit and good contact.	0.1

Table 4-2. *Organizational Preventive Maintenances Checks and Services*

Q-Quarterly
Total man-hours required:0.5

Sequence number	*Item to be inspected procedure*	Work time (M/H)
1	PUBLICATIONS: Sea that all publications are complete, serviceable, and current (DA Pam 310-4).	0.5
2	MODIFICATIONS: Check DA Pam 310-7 to determine if new applicable MWOs have been published. All urgent MWOS must be applied immediately. All normal MWOs must be scheduled (TM 38-750 and DA Pam 310-7).	
3	SPARE PARTS: Check all spare parts (operator/crew and organizational! for general condition and method of storage. No overstock should be evident and all shortages must be on valid requisitions.	

4-8. Cleaning

Inspect the exterior surfaces of the signal generator; exterior surfaces should be clean, free of dust, dirt, grease and fungus.

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

WARNING

The **fumes of trichloroethane are toxic.** Provide thorough ventilation whenever used. DO NOT USE NEAR AN OPEN FLAME. Trichloroethane is not flammable, but exposure of the fumes to an open flame or hot metal forms highly toxic phosgene gas.

b. Remove **grease,** fungus, and ground-in dirt **from the case;** use a cloth dampened (not wet) with trichloroethane (NSN 6810-00-292 -9625).

c. Remove dust or dirt from connectors with a brush.

d. Clean the front panel and control knobs; use a soft, clean cloth. If dirt is difficult to remove, dampen the cloth with water; use mild soap if necessary.

4-9. Touchup Painting

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 applicable cleaning and refinishing practices specified in TB 746-10.

CHAPTERS

CIRCUIT FUNCTIONING

5-1. Block Diagram

The basic circuitry of the test set is beat understood by reference to the block diagram, figure FO-1. The schematic wiring diagrams are shown in figures FO-2 and FO-3, respectively. The circuit is arranged to provide three separate control circuits, so that three separate currents may be applied to the apparatus under test without changes to the test connections. These three circuits are the number 1 circuit, the number 2 circuit, and the soak circuit. The value of current applied by number 1 circuit or number 2 circuit can be regulated and read on the milliammeter. The soak circuit is not adjustable as to current value and provides a fixed value of "soak" (heavy current).

5-2. Number 1 and 2 Circuits

Circuits 1 and **2 each** has its own rheostat, potentiometer and switch controlled resistors, and both use the milliammeter. These circuits provide a means by which the amount of current applied to the equipment under test can be regulated. Rheostats COARSE 1 and COARSE 2 provide a "coarse" series of resistance adjustment. Potentiometers FINE 1 and FINE 2 are used as "fine" series resistance adjustment. Fixed resistors in the number 1 and number 2 circuits are controlled by the 3000 -6000-0 and, 7500 -15000-0 and 15000 -30000-0 switches, respectively. The maximum resistance in number 1 circuit is 11500 ohms and in number 2 circuit, 65000 ohms. Both circuits (1 and 2) are protected by a 1/8 amp fuse and are connected to the milliammeter through the 75MA-150MA-15MA switch. Operation of this switch selects the scale **range** of the milliammeter.

5-3. Soak Circuit

The soak circuit path is not connected through the milliammeter or fuse and is not provided with adjustable resistors as is the other circuit paths. Fixed resistor network (50 ohm protective circuit), consisting of four 200 ohm resistors connected in parallel, is provided in the soak circuit path. Except for the voltage drop resulting from this circuit, the full battery voltage can be applied through the SOAK 1 switch to an external circuit. This is a means of applying a "soak" or saturating current as part of the electrical requirements check of certain relays or other apparatus.

5-4. Circuit Control Switches

(FO-2)

Current from an external battery or power source is connected through number 1, number 2, and soak circuit paths by operation ***of*** the circuit control switches, which are designated as 2-2 switch (S3) and SOAK-1 switch (S6). These switches are each three position switches and are nonoperated (open circuit) when in their normal (middle) position. 2-2 switch S3, when operated in either direction connects the current through the number 2 circuit path. Switch S3 in locking in one of its operated positions and non-locking (momentary) in the other. SOAK-1 switch S6 connects the current through number 1 circuit when operated in one direction (down) and connects the current through the soak circuit when operated in the other position (up). Switch S6 is nonlocking in both operated positions.

5-5. Connections to External Circuits (FO-2)

Binding posts designated BAT, GRD, T, R, **S, are** provided for making connections to an external circuit or the apparatus to be tested and to battery and ground. Jack J1 (designated BG) may be used instead of binding posts BAT and GRD. As shown in figure FO-2, the tip of jack J1 connects to binding post GRD and the ring of the jack connects to binding post BAT. Plug type PL-51 or equal (WE No. 110 or No. 310) may be connected to this jack.

5-6. Reversing Switch

The reversing REV switch S7 (REV) is provided to permit reversing the direction of the current flow through an external circuit connected to binding posts T and R.

CHAPTER 6

GENERAL SUPPORT MAINTENANCE INSTRUCTIONS

section I GENERAL

6-1. Troubleshooting Techniques

a General. The first procedure in servicing a defective test set is to sectionalize the fault. Sectionalization consists of tracing the fault to one of the three paths in the test set. Once the defective path is located, isolation to the defective part b accomplished. Troubleshooting is performed by the general support repairman.

b. Sectionalization. Listed in (1) through (4) below is a group of tests that are arranged to help locate the defect.

(1) *Visual inspection.* When the test set is brought in for repair, remove the test set from the case and inspect as follows:

(a) Check to see that all connection and resistors are properly seated. Repair or replace any connections or leads that are broken or otherwise defective.

(b) Check all switches and controls for ease of operation.

(c) Inspect for loose or miming screws.

(2) ***Operational tests.*** Operational tests frequently indicate the general location of trouble. In many instances, the teat will determine the exact nature of the fault. The operating procedures (pare 3-6 through 3-11), provide a good operational test.

(3) *Test* ***equipment. The*** following test equipment is required:

Meter Test Equipment TS-682A/GSM-l.
Multimeter TS-3S2B/U.

6-2. Troubleshooting Procedures

Troubleshooting at the general support maintenance level includes all of the general troubleshooting techniques. No elaborate troubleshooting procedures are required. First, trace the trouble to the circuit that is functioning abnormally. Second, isolate the defective pert.

a ***Make*** continuity tests with the TS-352B/U to isolate defective parts and wiring (figs. 6-2 and 6-3).

b. Check the mechanical operation end condition of all movable parts.

c. Test the meter with the TS-662A/GSM-1 in accordance with the applicable instructions in TM 11-2535A. The resistance of the meter is 200 ohms. A full scale meter deflection should be obtained when a current of .5 amp at .1 volt is applied to the meter terminals.

6-3. Repairs

a. Replace defective rheostats end resistors with new parts.

b. Clean, adjust, and repair the switches end jack as required.

C. Repair the meter as required with the applicable instructions in TM 11-4700.

CAUTION

Meter repair should be undertaken only by authorized instrument repair personnel in properly equipped shops. Attempted meter repair by unqualified personnel may result in irreparable damage to the meter.

6-4. Removal end Reinstallation of Parts

Any part of the test set can be removed individually when the mounting panel is removed from the case (figs. 6-1 and 6-2).

a To remove the mounting panel, unscrew the four panel screws (one at each comer) that secure the panel to the case and lift the entire mounting panel out of the case, All component are now readily available for removable.

b. To remove any part, unsolder or disconnect the leads and remove the mounting hardware. When a rheostat or any switch except S7 is to be removed the associated control knob on the front of the mounting panel must be removed first.

c. When parts are reinstalled, check the wiring carefully with the appropriate wiring diagram (fig. FO-3).

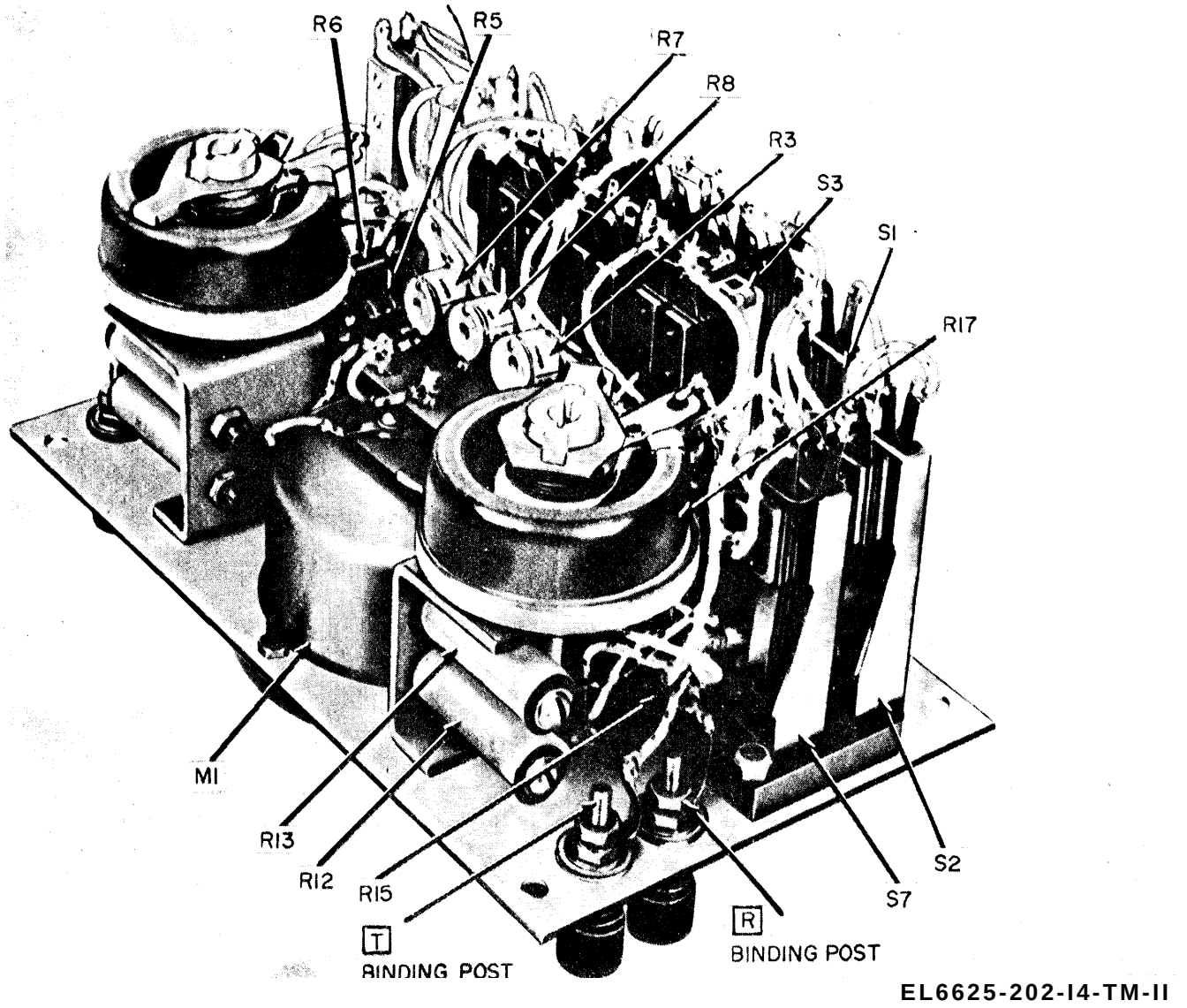


Figure 6-1, TS-1775/U, right oblique view of mounting panel removed from case.

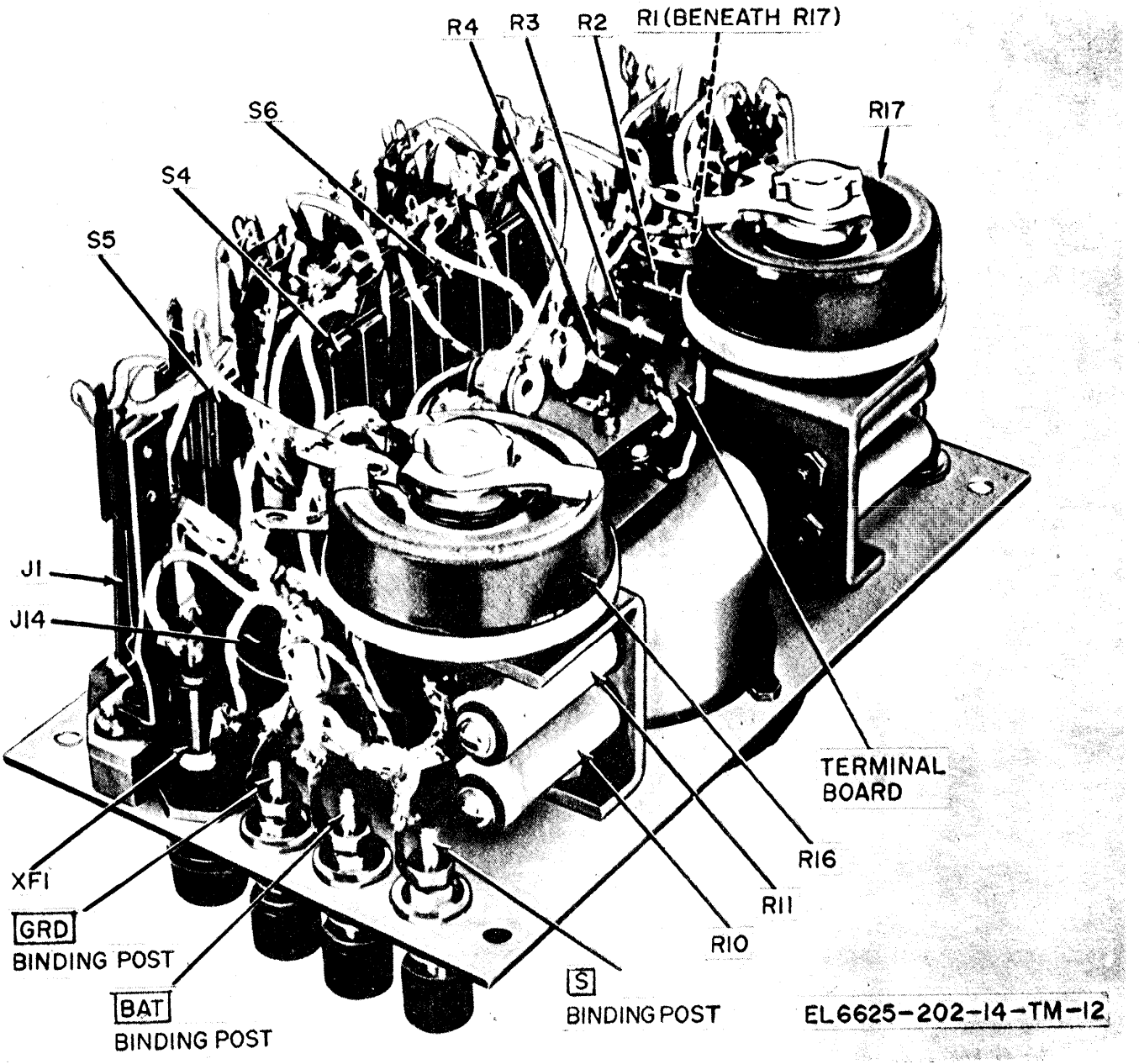


Figure 6-2. TS-1775/U, left oblique bottom view of mounting panel removed from case.

CHAPTER 7

GENERAL SUPPORT TESTING PROCEDURES

7-1. General Testing Procedures

a Tinting Procedures. The testing procedures are prepared for use by Electronic Field *Main*-tenance Shops and Electronic Service Organizations responsible for general support maintenance of electronic equipment to determine the acceptability of repaired equipment. These procedures set forth specific requirements that repaired equipment must meet before it is returned to the using organization.

b. Preliminary Instructions, Follow the instructions preceding each procedure before preceding to the procedure. Perform each step in sequence. Do not vary the sequence.

7-2. Test Equipment Required

The test equipment required for general support testing is shown in table ***7-1.***

Table 7-1. Test Equipment

Test equipment	*Technical manual*
Multimeter **TS-352B/U**	**TM 11-6625-203-12-35**

7-3. Number 1 Circuit Test

a Test Equipment.

(1) Multimeter TS-352B/U.

b. *Test Connectors.*

(1) Connect the negative lead of the multimeter to the BAT binding poet.

(2) Connect the positive lead of the multimeter to the T binding poet.

c. ***Procedure.***

(1) Set the multimeter to measure resistance.

(2) On the TS-1775/U, eat the 3000-6000-0 switch to 8000.

(3) Set the 75MA-150MA-15MA switch to 150MA.

(4) Set the COARSE 1 and FINE 1 rheostat fully cw.

(5) Depress the SOAK-1 switch to 1. The indicated resistance shall be 6000+20% ohms.

NOTE

The multimeter shall indicate an infinite resistance before depressing the switch.

(6) Set the 3000-6000-0 switch to 3000.

(7) Depress the SOAK-1 switch to 1. The indicated resistance shall be WOO ±20% ohms.

(8) Set the 3000 -6000-0 switch to 0.

(9) Depress the SOAK-1 switch to 1. The indicated resistance shall be less than 10 Ohms.

(10) Depress the SOAK-1 switch to 1 and rotate the 1 FINE control in a ccw direction. There shall be a smooth gradual rise in resistance reading on the multimeter to approximately 600 ohms with no evidence *of erratic* operation.

(11) Return the 1 FINE control to fully cw position.

(12) With the SOAK-1 switch depressed to 1, rotate the 1 COARSE control in ccw direction. There shall be a smooth gradual rice in resistance reading on the multimeter to approximately 6000 ohms with no evidence of erratic operation.

7-4. Number 2 Circuit Test

a. *Tent Equipment.* Multimeter TS-352B/U.

b. Tent Connections.

(1) Connect *the* negative lead of *the* multimeter to the BAT binding post.

(2) Connect the positive lead of the multimeter to the T binding post.

c. *Procedure.*

(1) Set the multimeter to measure resistance.

(2) set the 7500-15000-0 switch to l5000.

(3) Set the 15000-30000-0 switch to 30000.

(4) Set the 75MA-150MA-15MA switch at 150MA.

(5) Turn the FINE 2 and COARSE 2 controls fully cw. The multimeter shall indicate infinite resistance.

(6) Push the 2-2 switch to the up position. The multimeter shall indicate 45000±20% ohms.

(7) Set the 7600-15000-0 switch at O. The multimeter shall indicate 30000±20% ohms.

(8) Set the 15000 -30000-0 switch at 15000. The multimeter shall indicate 15000±20% ohms.

(9) Set the 15000-30000-0 switch at 0. The multimeter shall indicate lees than 50 ohms.

(1O) Set the 7500-15000-0 switch a t 7500. The multimeter shall indicate 7600*20 % ohms.

(11) set the 7500-15000-0 switch at o.

(2) Rotate the FINE 2 control in a ccw direction. There shall be a smooth gradual rice in resistance to 500 ohms with no *evidence of erratic* operation or skipping.

(13) Turn the FINE 2 control fully CW.

(14) Rotate the COARSE 2 control in a ccw

direction. There shall be a smooth gradual rise in resistance to 5000 ohms with no evidence of erratic operation or skipping.

(15) Turn the COARSE 2 control fully cw.

(16) Turn the FINE 1 and FINE 2 controls fully ccw.

(17) Set the No. 1 and No. 2 resistance switches at O.

(18) Set the 2-2 switch to the up position. Note the multimeter reading.

(19) Set the 2-2 switch to the center position.

(20) Set the SOAK-1 switch at 1 and note the multimeter reading. There shall be an increase in resistance reading over step (18).

7-5. Hold and Reverse Test

a. Test *Equipment.* Multimeter TS-352B/U.

b. Test Connections.

(1) Connect the negative lead of multimeter to the BAT binding post.

(2) Connect the positive lead of multimeter to the T binding post.

c. *Procedure.*

(1) Set the SOAK-1 and 2-2 switches at the center position (open). Multimeter shall indicate infinite resistance.

(2) Set the SOAK-1 switch at SOAK. Multimeter shall indicate 50±20% ohms.

(3) With the SOAK-1 switch at SOAK, depress the REV switch. Multimeter shall indicate an infinite resistance.

(4), Change multimeter lead from the T to the R binding post.

(5) Set the SOAK-1 switch at SOAK. Multimeter shall indicate an infinite resistance.

(6) Depress the REV switch. Multimeter shall indicate 50±20% ohms.

(7) Change multimeter lead from the BAT binding post to the GRD binding poet. Multimeter shall indicate O ohm.

(8) Depress the REV switch. Multimeter shall indicate infinite resistance.

(9) Connect one lead of multimeter to the S binding post.

(10) Connect the second lead of multimeter to the ring pf the BG receptacle. Multimeter shall indicate O ohm.

7-6. Milliammeter Test

(fig. 7-1)

a. Test Equipment.

(1) Multimeter TS-352B/U.

(2) Power Supply PP-3940/G.

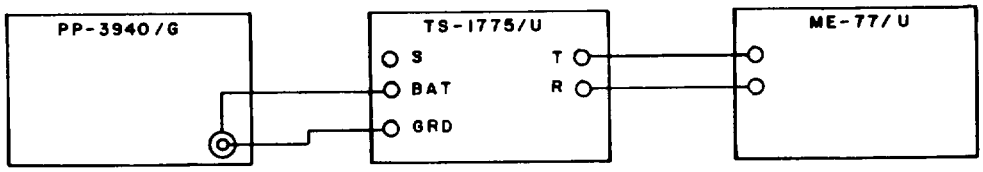


***Figure 7-1. Milliammeter test,* connections.**

b. Test Connections.

(1) Connect the voltage lead of multimeter to the R binding post.

(2) Connect the ground lead of multimeter to the T binding post.

(3) Connect the positive lead of the PP-3940/G to the GRD binding post.

(4) Connect the negative lead of the PP-3040/G to the BAT binding post.

c. *Procedure.*

(1) Set the SOAK-1 and 2-2 switches at the center position (open).

(2) Turn the 1 and 2 FINE and COARSE controls fully ccw. If necessary, adjust the panel meter to obtain a zero indication.

(3) Set the PP-3940/G for a 10-volt output.

(4) Set the SOAK-1 switch at 1.

(5) Adjust the 1 FINE and COARSE controls for a 150MA indication on multimeter. The panel meter shall read 150 ± 10%.

(6) Adjust the 1 FINE and COARSE controls for the following indications on multimeter: 125, 100, 75, 50, 25 ma. The panel meter readings shall be ± 10% of the indication on multimeter.

(7) Return the SOAK-1 switch to the *center* position and turn the 1 FINE and COARSE controls fully ccw.

(8) Set the 75 MA-150MA-15MA switch at, 75 MA.

(9) Set the SOAK-1 switch at 1.

(10) Adjust the 1 FINE and COARSE controls for a 75 ma indication on multimeter. The panel meter shall read 75 ±10 %.

(11) Return the SOAK-1 switch to the center

position and turn the 1 FINE and COARSE controls fully ccw.

(12) Set the 75MA-150MA-15MA switch at 15 ma.

(13) Set the SOAK-1 switch at 1.

(14) Adjust the 1 FINE and COARSE controls for a 15 ma indication on multimeter. The panel meter shall read 15±10%.

APPENDIX A

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	US Army Equipment Index of Modification Work Orders.
SB 38-100	Preservation, Packaging, Packing, and Marking Materials, Supplies and Equipment Used by the Army.
TB 746-10	Field Instructions for: Painting and Preserving Electronics Command Equipment
TM 740-90-1	Administrative Storage of Equipment
TM 750-244-2	Procedures for Destruction of Electronics Materiel to Prevent Enemy Use.
TM 11-2535B	Meter Test Set TS-682A/GSM-l
TM 11-6625-203-12	Operator and Organizational Maintenance, Multimeter AN/URM-105 including Multimeter ME-77/U
TM 11-6625 -366-15	Operator's, Organizational, DS, GS, and Depot Maintenance Manual: Multimeter TS-352B/U

APPENDIX C

MAINTENANCE ALLOCATION

Section 1. INTRODUCTION

C-1. General

This appendix provides a summary of the maintenance operations for TS-1775/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 es 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, preserve, drain, paint, or to replenish fuel/lubricants/hydraulic fluids or compressed air supplies.

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

e. *Align.* To adjust specified variable elements of an item to 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 equipment used in precision measurement. Consists of the comparison 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 en item, part, module (component or assembly) in a manner to allow the proper functioning of the equipment/system.

h. Replace. The act of substituting a serviceable like-type part, subassembly, model (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 y to an item by connecting specific damage, fault, malfunction, or failure in a part, subassembly, module/component/assembly, end item or system.

j. Overhaul. That periodic maintenance effort (service/action/necessary to restore an item to a completely serviceable/operational condition as prescribed by maintenance standards {e.g., 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 wit h original manufacturing standards. Rebuild is the highest degree of material 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 equipment/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 Function.* 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 "worktime" figure in the appropriate sub column(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 "worktime" figures will be shown for each category. The number of man-hours specified by the "worktime" 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 tot he 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.

C-4. Tool and Test Equipment Requirements (Table 1)

Tool or Test Equipment Reference 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 teat 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 noun name and nomenclature of the tools and test equipment required to perform the maintenance functions.

d. National/NATO Stock Number. This column lists the Nationa NATO stock number of the specific wool or test equipment.

e. *Tool Number.* This column lists the manufacturer's part number of the tool followed by the National supply code for manufacturers (5-digit) in parentheses.

SECTION II MAINTENANCE ALLOCATION CHART
FOR

TEST SET RELAY, TS-1775/U

(1) GROUP NUMBER	(2) COMPONENT, 'ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY C	O	F	H	D	(5) TOOLS AND EQUIPMENT
00	**TEST SET RELAY TS-1775/U**	**Service**		0.5				
		Adjust		0.5				
		Inspect		0.5				
		Inspect				0.5		
		Test		0.5				L
		Test				1.0		2-5
		Replace		0.5				
		Repair				2.0		4
		overhaul					3.0	1-5

TABLE I. TOOL AND TEST EQUIPMENT REQUIREMENTS FOR

TEST SET RELAY, TS-1175/U

TOOL OR TEST EQUIPMENT REF CODE	MAINTENANCE CATEGORY	NOMENCLATURE	NATIONAL/NATO STOCK NUMBER	TOOL NUMBER
	0	MULTIMETER , AN/URM-105	6625-00-581-2036	1
	HD	MULTIMETER, TS-352B/U	6625-00-553-0142	2
	HD	METER TEST SET, TS-682A/GEM-1	6625-00-669-0747	3
	HD	TOOL KIT, TS-100/G	5180-00-605-0079	4
	HD	POWER SUPPLY, PP-3940/G	6130-00-953-7500	5
	0	TOOLS AND TEST EQUIPMENT NORMALLY SUPPLIED TO THE REPAIRMAN USER BECAUSE OF HIS ASSIGNED MISSION		

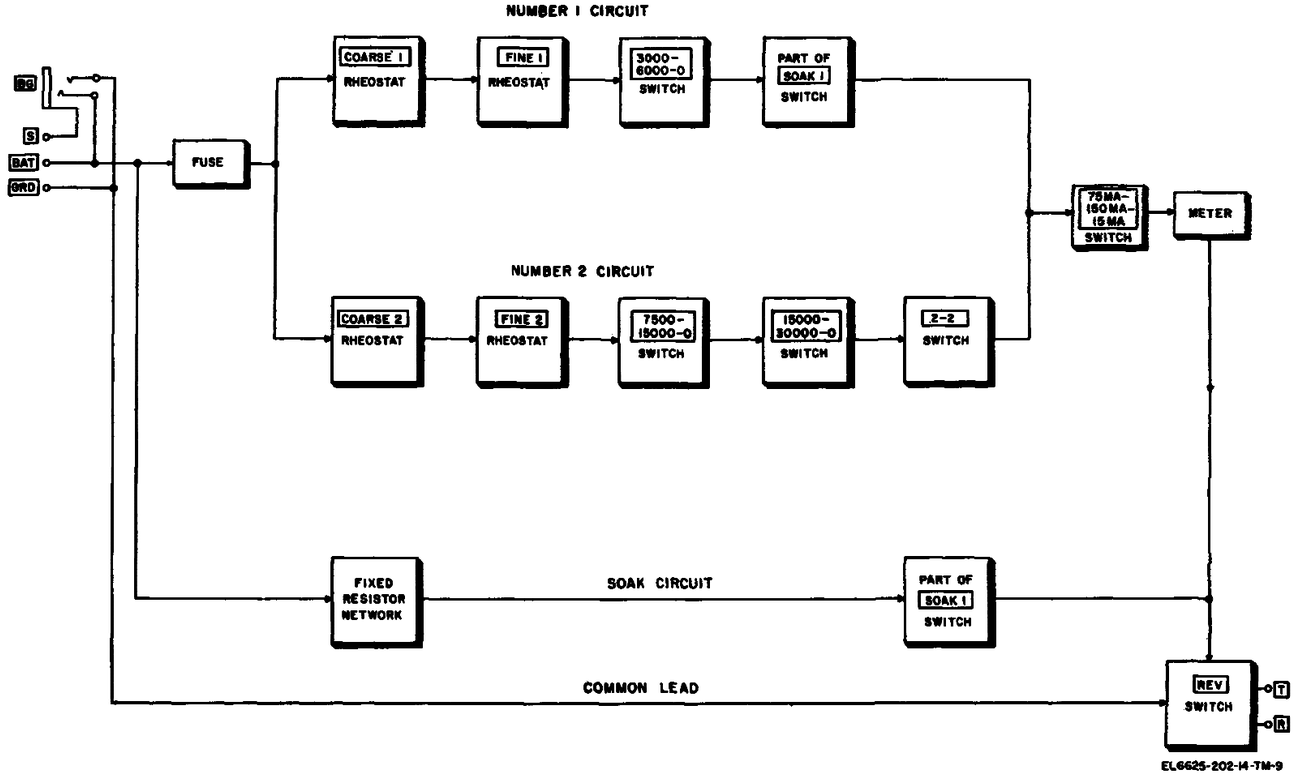


Figure FO-1. Test Set, Relay TS-1775/U, block diagram.

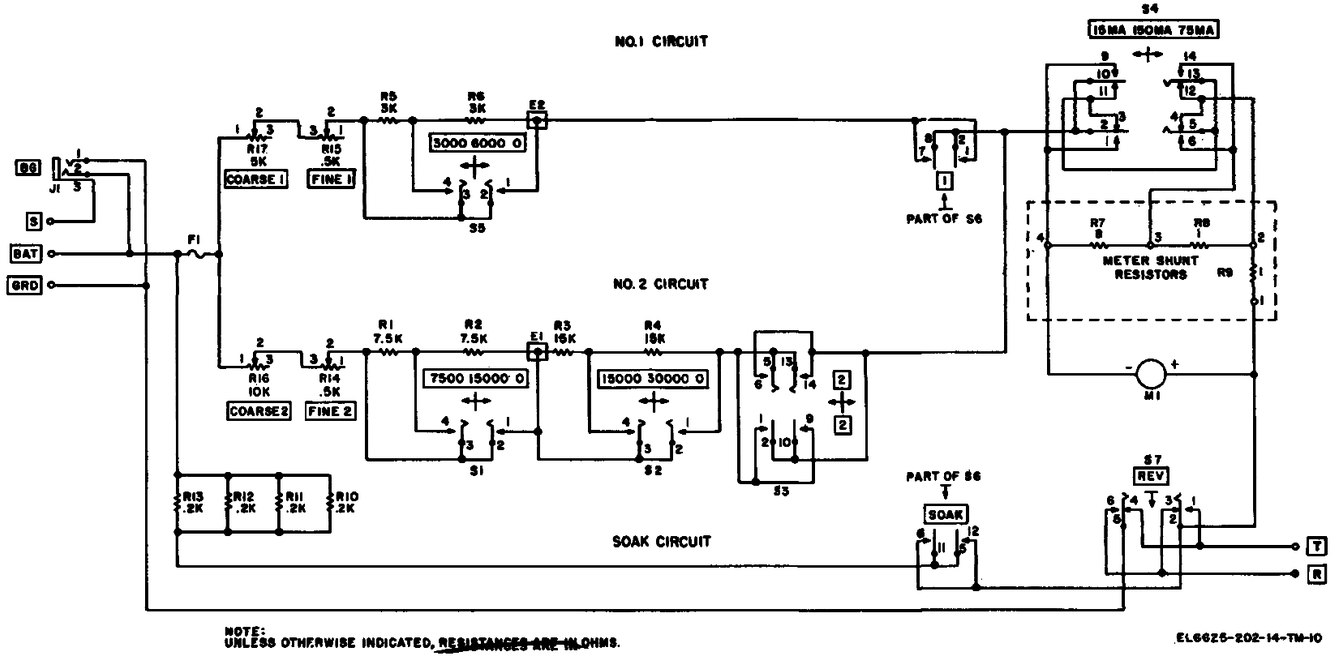


Figure FO-2. Test Set Relay TS-1775/U, schematic diagram.

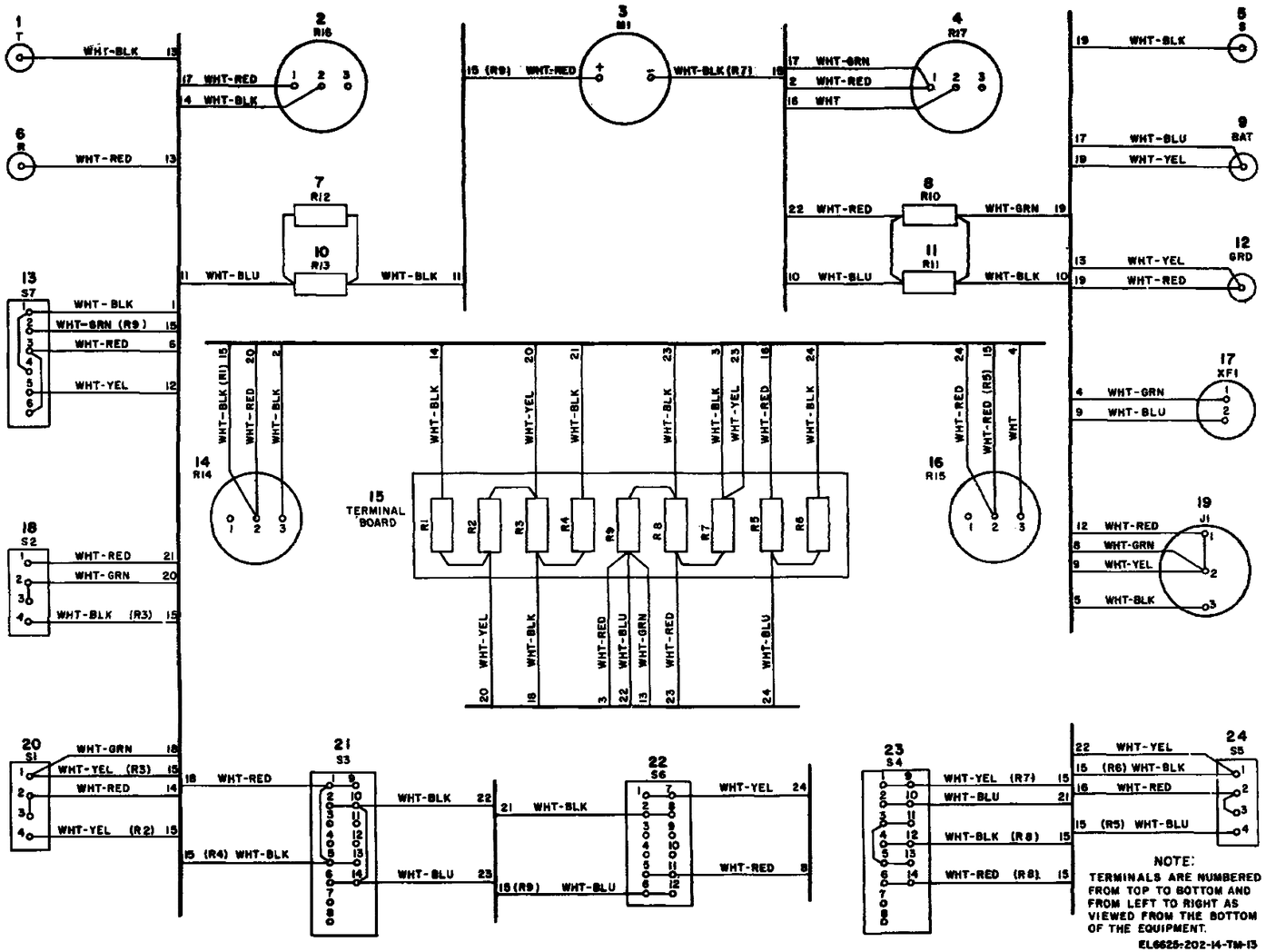


Figure FO-3. Test Set, Relay TS-1775/U wiring diagram.

By Order of the Secretary of the Army:

FRED C. WEYAND
General, United States *Army*
Chief of Staff

Official:
PAUL T. SMITH
Major General, United States Army
The Adjutant General

Distribution:

Active Army:

USASA (2)
Dir of Trans (1)
COE (1)
TSG (1)
USAARENBD (1)
AMC (1)
MICOM (2)
TECOM (2)
TRADOC (2)
ARADCOM (2)
ARADCOM Rgn (2)
OS Maj Comd (4)
LOGCOMD (3)
USACC (4)
MDW (1)
Armies (2)
corps (2)
HISA (Ft Monmouth) (33)
Ft Gillem (10)
Ft Gordon (10)
Ft Huachuca (10)
Ft Carson (5)
Ft Richardson **(ECOM OfC)** (2)
WSMR (1)
Svc Colleges (1)
USASESS (5)
USAINTCS (3)
USAADS (2)
USAFAS (2)
USAARMS (2)
USAIS (2)
USAES (2)
AD (1) except
SAAD (30)
LBAD (14)
TOAD (14)
SHAD (3)
USA Dep (2)
Sig Sec USA Dep (2)
Sig Dep (2)
ATS (1)
MAAG (1)
WRAMC (1)
USARMIS (1)
USAERDAA (1)
USAERDAW (1)
Sig FLDMS (1)
Units org under fol TOE: -1 ea.
7
7-100
11-15
11-16
11-18
11-36
11.37
11-38
11.39
11-65
11-95
11-96
11-97
11-98
11-117
11-237
11-500 (AA-AC)
17
17-100
29-1
29-21
29-25
29-26
29-35
29-36
29-51
29-55
29-56
29-65
32-67
37
37-100
39-51
57
57-100

ARNG: State AG (3): Units - Same as Active Army except allowance is one (1) copy each.

USAR: None.

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

* U.S. GOVERNMENT PRINTING OFFICE: 1982--359-326/3252

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The Metric System and Equivalents

Linear Measure

1 centimeter = 10 millimeters = .39 inch
1 decimeter = 10 centimeters = 3.94 inches
1 meter = 10 decimeters = 39.37 inches
1 dekameter = 10 meters = 32.8 feet
1 hectometer = 10 dekameters = 328.08 feet
1 kilometer = 10 hectometers = 3,280.8 feet

Weights

1 centigram = 10 milligrams = .15 grain
1 decigram = 10 centigrams = 1.54 grains
1 gram = 10 decigram = .035 ounce
1 dekagram = 10 grams = .35 ounce
1 hectogram = 10 dekagrams = 3.52 ounces
1 kilogram = 10 hectograms = 2.2 pounds
1 quintal = 100 kilograms = 220.46 pounds
1 metric ton = 10 quintals = 1.1 short tons

Liquid Measure

1 centiliter = 10 milliters = .34 fl. ounce
1 deciliter = 10 centiliters = 3.38 fl. ounces
1 liter = 10 deciliters = 33.81 fl. ounces
1 dekaliter = 10 liters = 2.64 gallons
1 hectoliter = 10 dekaliters = 26.42 gallons
1 kiloliter = 10 hectoliters = 264.18 gallons

Square Measure

1 sq. centimeter = 100 sq. millimeters = .155 sq. inch
1 sq. decimeter = 100 sq. centimeters = 15.5 sq. inches
1 sq. meter (centare) = 100 sq. decimeters = 10.76 sq. feet
1 sq. dekameter (are) = 100 sq. meters = 1,076.4 sq. feet
1 sq. hectometer (hectare) = 100 sq. dekameters = 2.47 acres
1 sq. kilometer = 100 sq. hectometers = .386 sq. mile

Cubic Measure

1 cu. centimeter = 1000 cu. millimeters = .06 cu. inch
1 cu. decimeter = 1000 cu. centimeters = 61.02 cu. inches
1 cu. meter = 1000 cu. decimeters = 35.31 cu. feet

Approximate Conversion Factors

To change	*To*	*Multiply by*	*To change*	*To*	*Multiply by*
inches	centimeters	2.540	ounce-inches	newton-meters	.007062
feet	meters	.305	centimeters	inches	.394
yards	meters	.914	meters	feet	3.280
miles	kilometers	1.609	meters	yards	1.094
square inches	square centimeters	6.451	kilometers	miles	.621
square feet	square meters	.093	square centimeters	square inches	.155
square yards	square meters	.836	square meters	square feet	10.764
square miles	square kilometers	2.590	square meters	square yards	1.196
acres	square hectometers	.405	square kilometers	square miles	.386
cubic feet	cubic meters	.028	square hectometers	acres	2.471
cubic yards	cubic meters	.765	cubic meters	cubic feet	35.315
fluid ounces	milliliters	29,573	cubic meters	cubic yards	1.308
pints	liters	.473	milliliters	fluid ounces	.034
quarts	liters	.946	liters	pints	2.113
gallons	liters	3.785	liters	quarts	1.057
ounces	grams	28.349	liters	gallons	.264
pounds	kilograms	.454	grams	ounces	.035
short tons	metric tons	.907	kilograms	pounds	2.205
pound-feet	newton-meters	1.356	metric tons	short tons	1.102
pound-inches	newton-meters	.11296			

Temperature (Exact)

°F	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	°C

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