DEPARTMENT OF THE ARMY TECHNICAL MANUAL

DEPARTMENT OF THE AIR FORCE TECHNICAL ORDER

TM 11-6625-202-10

TO 33A1-12-24-1

# OPERATOR'S MANUAL

# TEST SETS
# I-181, I-181A, AND I-181B

*DEPARTMENTS OF THE ARMY AND THE AIR FORCE*
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TECHNICAL MANUAL
No. 11-6625-202-10
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*This manual supersedes so much of TM 11-2036, 30 August 1944, including C 1, 2 November 1948, and C 2, 8 February 1951, as pertains to operator's instructions.

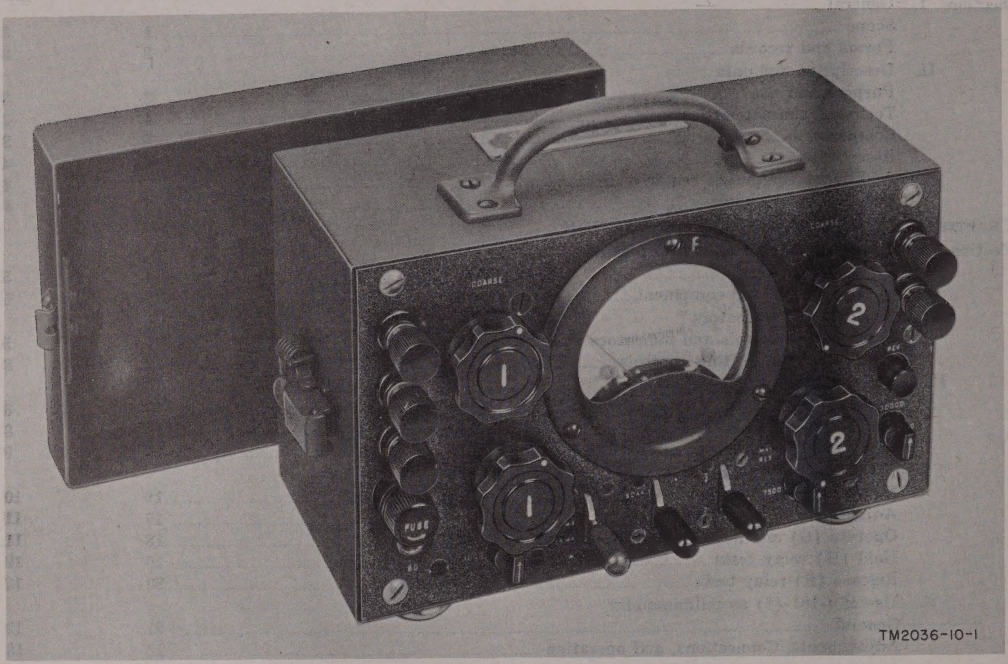



*Figure 1. Test Set I-181-B, less cords and spare fuses.*

# CHAPTER 1
# INTRODUCTION

## Section I. GENERAL

### 1. Scope

*a.* This manual describes Test Sets I-181, I-181-A, and I-181-B (fig. 1) and covers installation, operation, and operator's maintenance.

*b.* Official nomenclature followed by (*) is used to indicate all models of the equipment item covered in this manual. Thus, Test Set I-181-(*) represents Test Sets I-181, I-181-A, and I-181-B.

*c.* The maintenance allocation chart is published in TM 11-6625-202-20.

### 2. Forms and Records

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

*b. Report of Damaged or Improper Shipment.* Fill out and forward DD Form 6 (Report of Damaged or Improper Shipment) as prescribed in AR 700-58 (Army).

*c. Preventive Maintenance Form.* Prepare DA Form 11-266 (Maintenance Check List for Signal Equipment) (Test Equipment) (figs. 9 and 10), in accordance with instructions on the form.

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

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

## Section II. DESCRIPTION AND DATA

### 3. Purpose and Use

Test Set I-181-(*) 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 be used, also, as a dc milliammeter.

### 4. Technical Characteristics

| | |
|---|---|
| Types of relay tests that can be made | Operate.<br>Nonoperate.<br>Hold.<br>Release. |
| Types of relays that can be tested | Neutral.<br>Polar. |
| Test current: | |
| Source | External. |
| Range | Adjustable, 0 to 150 ma. |
| Milliammeter: | |
| Type | Direct current. |
| Scales | Three; 0 to 15 ma, 0 to 75 ma, and 0 to 150 ma. |
| Accuracy | ±2 percent, each scale. |
| Sensitivity | 5 ma. |
| Fuse | ⅛-ampere, 125-volt, 7.9 ohms, cartridge type. |
| Weight | 9 lb (approx). |

### 5. Components

| Quantity | Item | Dimensions (in.) Height | Depth | Width | Unit weight (lb) |
|---|---|---|---|---|---|
| 1 | Test unit | 6⅜ | 5½ | 9½ | 9 (approx) |
| 4 | Test cord assembly, 1-conductor, 6 feet long. | | | | |
| 1 | Test cord assembly, 2-conductor, 6½ feet long. | | | | |
| 1 set | Runing spares, consisting of five ⅛ ampere fuses. | | | | |

*Note.* The dimensions given for the test set are approximate. The various models of the equipment differ slightly in size.

## 6. Description

(fig. 1)

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 (par. 5). 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.

## 7. Additional Equipment Required

*a.* When station battery is unavailable, or unsuitable, a dry cell battery (such as 22½-volt or 45-volt dry cell battery) is required to provide power for the test set when checking relays.

*b.* The connecting tools listed below are contained in Tool Equipment TE-123 and are needed for use with Test Set I-181-(*). These connecting tools have pin terminals that fit into the socket-type connectors that terminate the test cords (par. 6).

| WECo tool No. | Description and use | Federal stock No. |
|---|---|---|
| 361B | Special tool for connections to front or adjustment side of E, R, and similar types of relays. | 6625-408-2031 |
| 364 | Spade terminal for connections to binding posts. | 5940-199-9598 |
| 365 | Alligator clip for connections to relay winding terminals. | 5940-265-6541 |
| 411A | Test pick with an adjustable-length test prod. | 6625-243-8468 |
| 419A | Spring jaw clip with bent-tweezer type tip for connections to narrow terminals and where spacing between terminals is very limited. | 5120-309-5678 |
| 428A | Special tool for connections to front windings of 149, 162, 178, and similar types of relays. | 5120-309-5679 |
| 509A | Special tool for connections to the front of U-, UA-, and Y-type relays. | 5120-309-5681 |
| KS-6278 | Narrow jaw, suspender-type clip for connections to relay winding terminals. | 5940-230-1216 |

## 8. Differences in Models

Test Sets I-181, I-181-A, and I-181-B are similar in purpose, operation, and general appearance and may be used interchangeably. The test sets furnished on the various procurements of the I-181-(*) differ slightly in size and in the appearance of the panel. The milliammeter furnished with early procurements has provisions for the zero adjustment of the pointer. The sealed-type milliammeter used in the I-181-B or Order No. 21509-Phila-56 has no provision for zero adjustment. There are no differences that affect the operation of the test set.

# CHAPTER 2

# INSTALLATION AND OPERATION

## Section I. SERVICE UPON RECEIPT OF EQUIPMENT

### 9. Unpacking

*a. Packaging Data.* Packed for shipment, Test Set I-181-(*) is cushioned on all sides and packaged in a water-resistant fiberboard carton and sealed with pressure-sensitive tape. Several packaged test sets are packed in a nailed wooden box. For oversea shipment, the wooden shipping box is reinforced with steel strapping. Each packaged test set measures 7⅛ inches by 10¾ inches by 7⅛ inches, has a volume of .32 cubic feet, and weighs 15 pounds.

*b. Removing Contents.*

(1) Cut the metal straps at a point just below the box cover.

(2) Using a nail puller, remove the nails that secure the box cover and lift off the cover. Do not attempt to pry off the cover; prying may damage the equipment.

(3) Remove the test sets from the shipping box.

(4) Slit each carton along three edges and fold back the cover; use the uncut edge as a hinge.

(5) Remove each test set from its carton.

### 10. Checking Unpacked Equipment

*a.* Inspect each test set for damage incurred during shipment. If a test set has been damaged, refer to paragraph 2*b*.

*b.* Check each test set against the packing list. When no packing list accompanies the test set, use the table of components (par. 5) as a general check for completeness.

## Section II. CONTROLS AND INDICATORS

### 11. Function of Controls and Indicators

*a. Controls* (figs. 2 and 3)

| Control | Function |
|---|---|
| COARSE 1 rheostat | Provides coarse adjustment of current in No. 1 circuit. |
| FINE 1 rheostat | Provides fine adjustment of the current in No. 1 circuit. |
| 3000-6000-0 twist switch. | Provides coarse adjustment (2 steps) of the current in No. 1 circuit. |
| SOAK-1 switch | Three-position switch; in the up (SOAK) position (nonlocking), closes the soak circuit; in the down (1) position (nonlocking), closes No. 1 circuit; in the center (normal, locking) position, both circuits are open. |
| COARSE 2 rheostat | Provides coarse adjustment of the current in No. 2 circuit. |
| FINE 2 rheostat | Provides fine adjustment of the current in 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 (2 steps) of the current in 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 circuit 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 reverses the current flow at the T (tip) and R (ring) binding posts. |

*b. Indicator.* Only one indicator (milliammeter) is provided with the test set. It is used to measure circuit current.

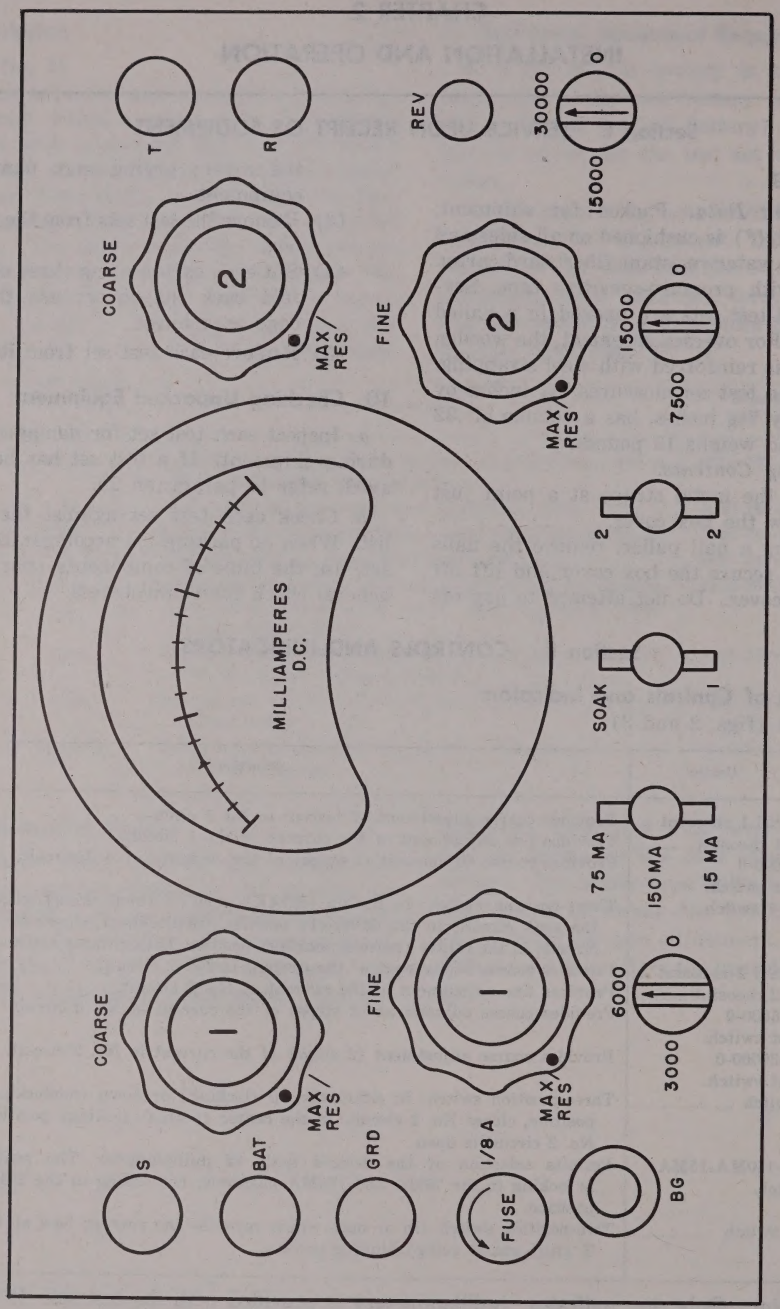



*Figure 2. Test Set I-181-(*), control and indicator panel.*

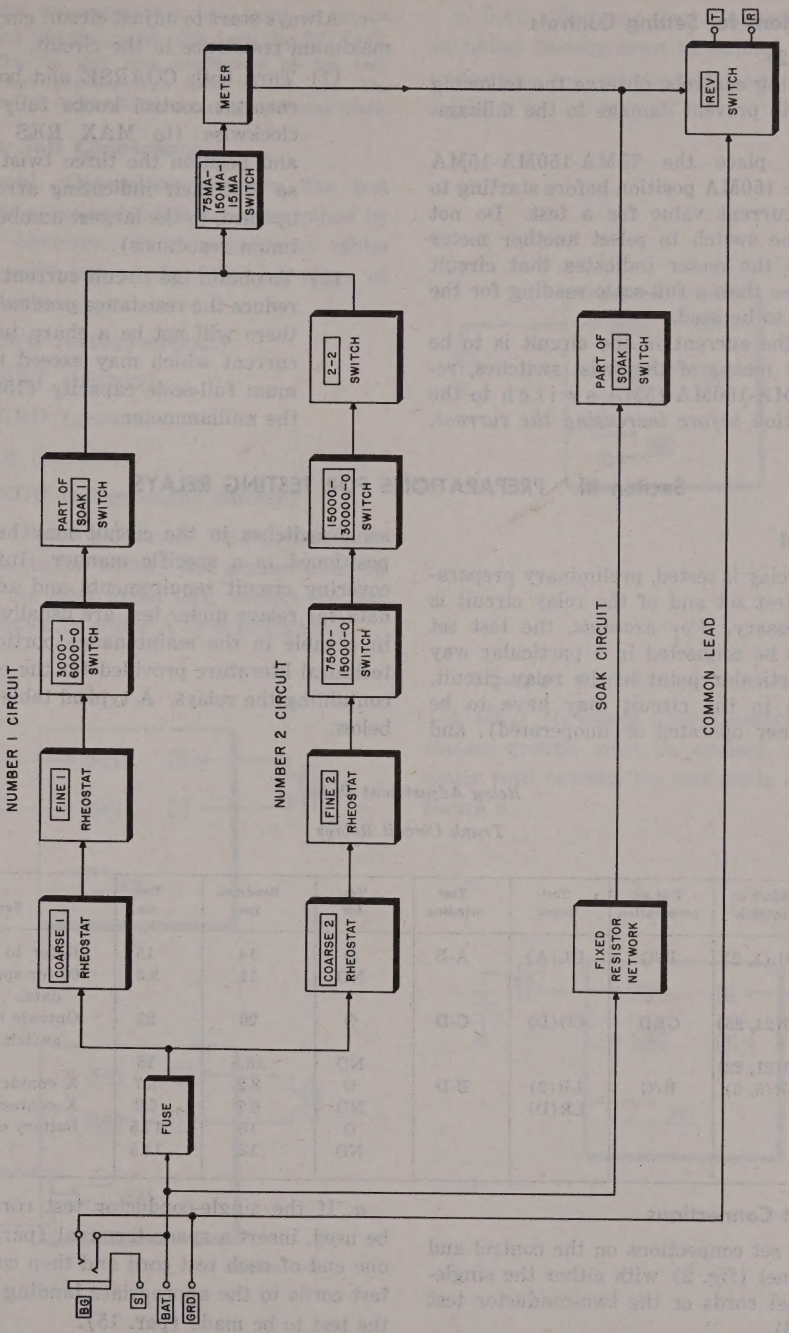



*Figure 3. Block diagram of test circuits.*

## 12. Precautions for Setting Controls

(fig. 2)

When setting controls, observe the following precautions to prevent damage to the milliammeter—

*a.* Always place the 75MA-150MA-15MA switch in the 150MA 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 maximum resistance in the circuit.

(1) Turn both COARSE and both FINE rheostat control knobs fully counterclockwise (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 milliammeter.

## Section III. PREPARATIONS FOR TESTING RELAYS

## 13. General

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 relay 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. Information 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.

*Relay Adjustment Data*

*Trunk Circuit Relays*

| Relay | Block or insulate | Test set preparation | Test point | Test winding | Test for | Readjust ma | Test ma | Remarks |
|---|---|---|---|---|---|---|---|---|
| DL | DL(1, 2) | B/G | DL(A) | A-B | O | 14 | 15 | Refer to paragraph |
| | | | | | NO | 11 | 9.5 | 00 for spring gaging data. |
| CO | CO(24, 25) | GRD | CO(D) | C-D | O | 20 | 22 | Operate transfer switch. |
| | CO(21, 22) | | | | 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 | Battery on contact 6. |
| | | | | | NO | 13 | 11.5 | |

## 14. Test Set Connections

Make test set connections on the control and indicator panel (fig. 2) with either the single-conductor test cords or the two-conductor test cord (par. 6).

*a.* If the single-conductor test cords are to be used, insert a spade terminal (par. 7*b*) into one end of each test cord and then connect the test cords to the appropriate binding posts for the test to be made (par. 15).

*b.* If the two-conductor test cord is to be used, insert the test cord plug into the BG jack.

*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.

## 15. 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 4.

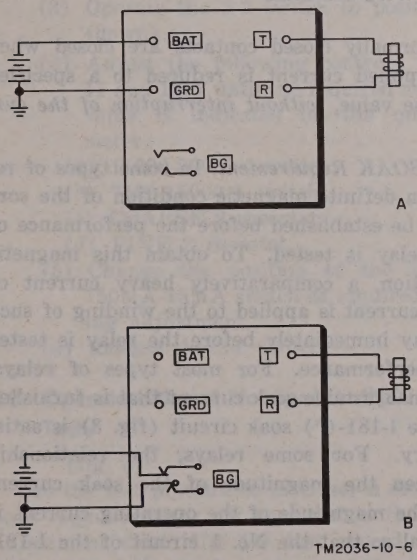



*Figure 4. B/G (battery-ground) test connections.*

*c. BAT (Battery) Test Connections.* When grounded battery must be applied to the relay under test, connect the test cords as shown in figure 5.

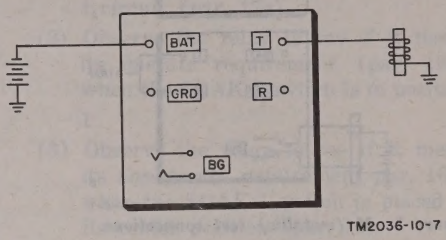



*Figure 5. BAT (battery) test connections.*

*d. GRD (Ground) Test Connection.* When station ground must be applied to the relay under test, connect the test cords as shown in figure 6.

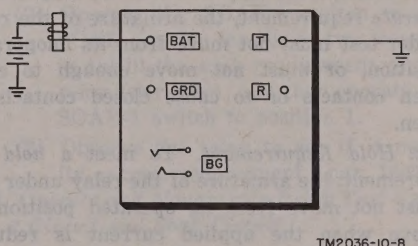



*Figure 6. GRD (ground) test connection.*

*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 7.

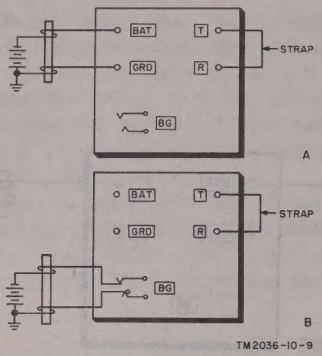



*Figure 7. M (metallic) test connections.*

*f. NGB (Nongrounded battery) Test Connections.* When nongrounded battery must be applied to the relay under test, connect the test cord as shown in figure 8.

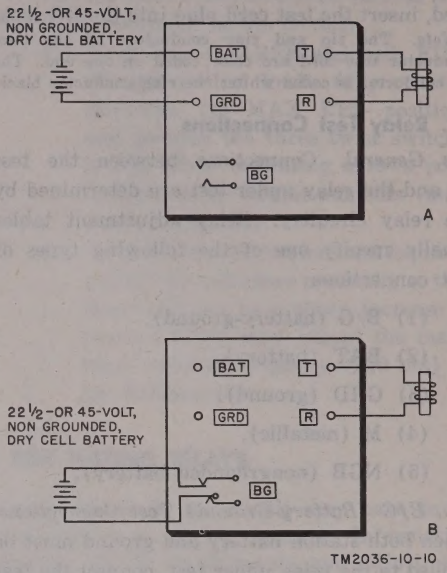



*Figure 8. NGB (nongrounded battery) test connections.*

## Section IV. RELAY TESTING PROCEDURES

### 16. 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 close 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 (*a* 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 so that all normally open contacts are open and all normally closed contacts are closed 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 I-181-(*) soak circuit (fig. 3) 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 I-181-(*) should be used to provide adjustable soak current.

## 17. 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 (fig 3).

*a. No. 1 Circuit.* To establish the required relay test current in the No. 1 circuit:

(1) Operate the 75MA-150MA-15MA switch to position 150MA (par. 11*a* and *b*).

(2) Depress the REV switch.

(3) Operate the SOAK-1 switch to position 1.

(4) Adjust the following controls (pars. 11 and 12*c*) 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-150MA-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) Operate the 75MA-150MA-15MA switch to position 150MA (par. 12*a* and *b*).

(2) Depress the REV switch.

(3) Operate the 2-2 switch to position 2 (down).

(4) Adjust the following controls (pars. 11 and 12*c*) until the required current value is indicated on the milliammeter:

(*a*) 15000-30000-0 switch.

(*b*) 7500-15000-0 switch.

(*c*) COARSE 2 rheostat.

(*d*) FINE 2 rheostat.

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

(6) Release the 2-2 switch.

## 18. Operate (O) and Nonoperate (NO) Relay Tests

(fig. 3)

Use the test procedures in either *a* or *b* if a *soak* requirement *is not specified* in the relay adjustment data. Use the test procedures in either *c* or *d* if a *soak* requirement is *specified* in the relay adjustment data and if the *value* of the *soak* current is not indicated. Use the test procedures in *e* if a *soak* requirement *is specified* in the relay adjustment data and if the value of the *soak* current is also specified.

*Note.* The maximum resistance in the No. 2 circuit is greater than the maximum resistance in the No. 1 circuit; therefore, smaller magnitudes of current can be established in the No. 2 circuit than can be established in the No. 1 circuit.

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

(1) Establish the *operate* current in No. 1 circuit (par. 17*a*).

(2) Observe the relay to see if it meets its *operate* requirement (par. 16*a*) when the SOAK-1 switch is in position 1.

(3) Observe the relay to see if it meets its *nonoperate* requirement par. 16*b*) when the SOAK-1 switch is placed in its center position (par. 12).

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

(1) Establish the *operate* current in No. 2 circuit (par. 17*b*).

(2) Observe the relay to see if it meets its *operate* requirement (par. 16*a*) when the 2-2 switch is operated to position 2 (down).

(3) Observe the relay to see if it meets its *nonoperate* requirement (par. 16*b*) when the 2-2 switch is placed in its center position (par. 11).

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

(1) Establish the *operate* current in No. 1 circuit (par. 17*a*).

(2) Operate the SOAK-1 switch to the SOAK position for one or two seconds, to fulfill the *soak* requirement of the relay (par. 16*e*), and then operate the SOAK-1 switch to position 1.

(3) Observe the relay to see if it meets its *operate* requirement (par. 16*a*).

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

(1) Establish the *operate* current in No. 2 circuit (par. 17*b*).

(2) Operate the SOAK-1 switch to the SOAK position for one or two seconds, to fulfill the *soak* requirement of the

relay (par. 16*e*), 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 (par. 16*a*).

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

(1) Establish the *operate* current in No. 2 circuit (par. 17*b*).

(2) Establish the *soak* current in No. 1 circuit (par. 17*a*).

(3) Operate the SOAK-1 switch to position 1 for one or two seconds, to fulfill the *soak* requirement of the relay (par. 16*e*), 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 (par. 16*a*).

## 19. Hold (H) Relay Tests

(fig. 3)

Use the test procedures in *a* if a specific value of *operate* current or *soak* current is specified in the relay adjustment data; use the test procedures in *b* if a *soak* current is required and its value is not specified.

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

(1) Establish the *hold* current in No. 2 circuit (par. 17*b*).

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

(3) Establish the *operate* current or *soak* current in No. 1 circuit (par. 17*a*).

(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 (par. 16*c*).

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

(1) Establish the *hold* current in No. 2 circuit (par. 17*b*).

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

(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 (par. 16*c*).

## 20. Release (R) Relay Tests

(fig. 3)

Use the test procedures in *a* if a specific value of *operate* current or *soak* current is specified in the relay adjustment data; use the test procedures in *b* if a *soak* current is required and its value is not specified.

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

(1) Establish the *release* current in No. 2 circuit (par. 17*b*).

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

(3) Establish the *operate* current or *soak* current in No. 1 circuit (par. 17*a*).

(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 (par. 16*d*).

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

(1) Establish the *release* current in No. 2 circuit (par. 17*b*).

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

(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 (par 16*d*).

# Section V. USE OF THE I-181-(*) AS A MILLIAMMETER

## 21. General

When the I-181-(*) is used as a milliammeter, the internal resistance of the test set circuitry is about 9 ohms for the 150 milliampere range, about 10 ohms for the 75 milliampere range, and about 15 ohms for the 15 milliampere range. These resistance values

include the resistance of the milliammeter and the fuse; the resistance of the fuse is approximately 7.9 ohms.

## 22. Adjustments, Connections, and Operation

*a.* Turn the COARSE 2 rheostat to its extreme clockwise position.

*b.* Turn the FINE 2 rheostat to its extreme clockwise position.

*c.* Operate the 7500-15000-0 twist switch to position 0.

*d.* Operate the 15000-30000-0 twist switch to position 0.

*e.* Operate the 75MA-150MA-15MA switch (par. 11) to the appropriate position for the magnitude of current to be measured.

*Caution:* When the approximate magnitude of the current in the circuit under test 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 15MA) on the meter.

*f.* Strap binding posts T and R together.

*g.* Connect the circuit under test to the BAT and GRD binding posts, or to jack BG (par. 14).

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

# CHAPTER 3
# MAINTENANCE INSTRUCTIONS

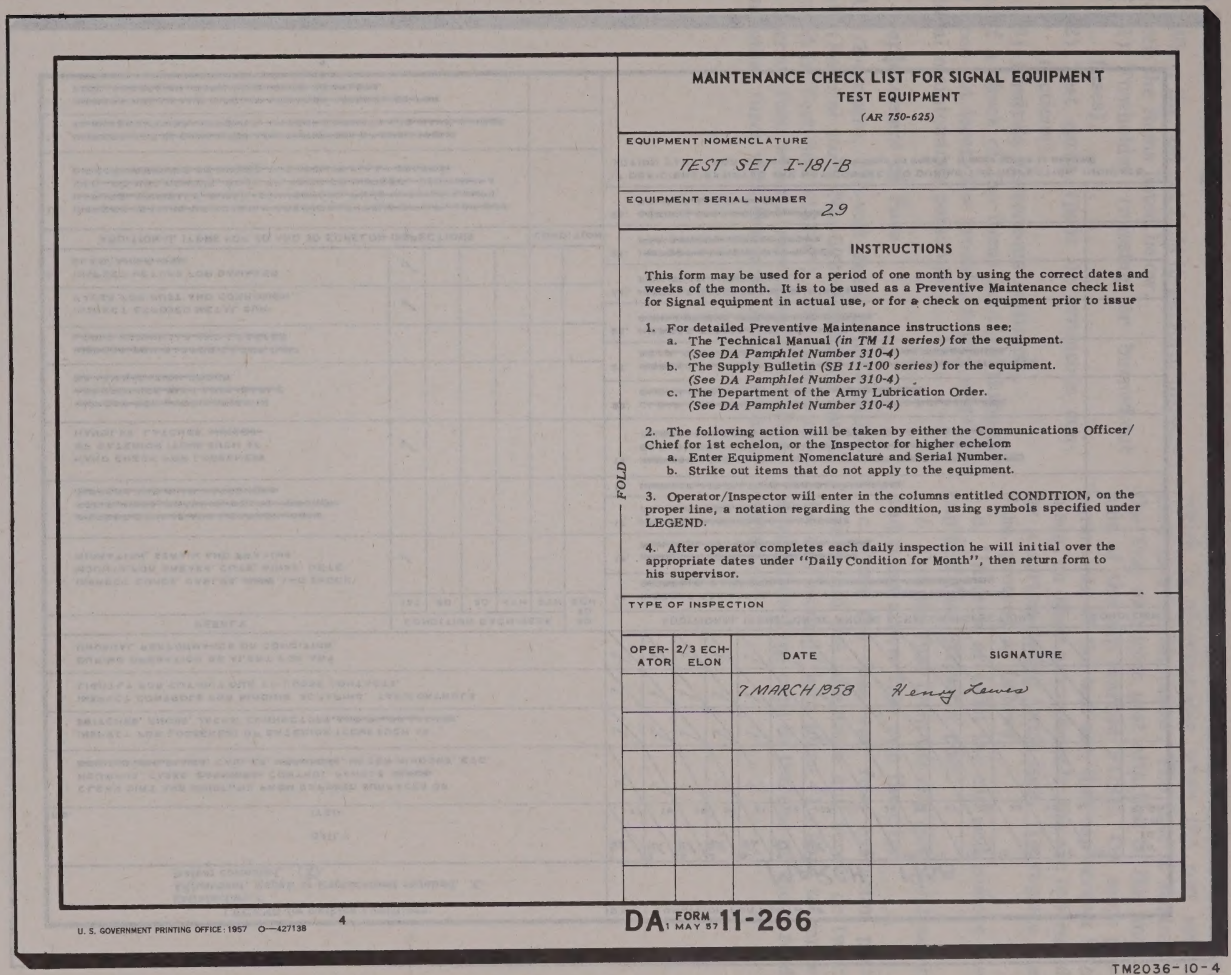
## 23. Scope of Operator's Maintenance

The maintenance duties normally performed by the operator of Test Set I-181-(*) are listed below. No tools or test equipment are required for the performance of these duties.

*a.* Preventive maintenance (par. 24).
*b.* Troubleshooting (par. 25).
*c.* Replacement of fuse (par. 26).

## 24. Preventive Maintenance

DA Form 11-266 (fig. 9 and 10) is a preventive maintenance check list to be used by the operator. Items not applicable to the equipment and operations that are not to be performed by the operator are lined out in figure 10. Instructions for the use of the form appear on the form.



## MAINTENANCE CHECK LIST FOR SIGNAL EQUIPMENT
### TEST EQUIPMENT
*(AR 750-625)*

EQUIPMENT NOMENCLATURE: TEST SET I-181-B

EQUIPMENT SERIAL NUMBER: 29

### INSTRUCTIONS

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

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

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

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

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

FOLD

TYPE OF INSPECTION

| OPERATOR | 2/3 ECHELON | DATE | SIGNATURE |
|---|---|---|---|
| | | 7 MARCH 1958 | Henry Lewis |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

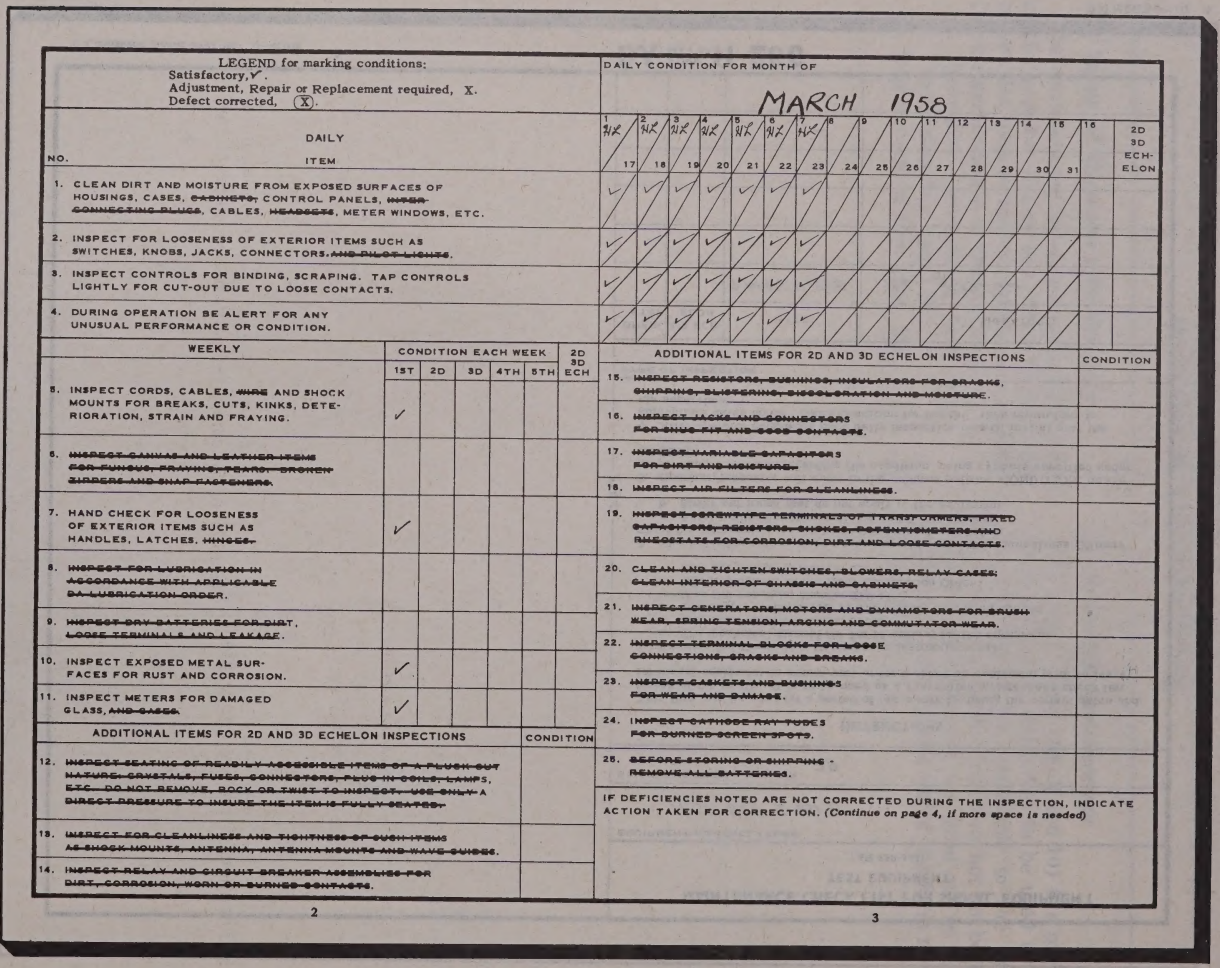
4

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DA FORM 1 MAY 57 11-266

TM2036-10-4

*Figure 9. DA Form 11-266, pages 1 and 4.*



LEGEND for marking conditions:
Satisfactory, ✓.
Adjustment, Repair or Replacement required, X.
Defect corrected, (X).

DAILY CONDITION FOR MONTH OF MARCH 1958

| NO. | DAILY ITEM | 1 NR 17 | 2 NR 18 | 3 NR 19 | 4 NR 20 | 5 NR 21 | 6 NR 22 | 7 NR 23 | 8 24 | 9 25 | 10 26 | 11 27 | 12 28 | 13 29 | 14 30 | 15 31 | 16 | 2D 3D ECHELON |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. | CLEAN DIRT AND MOISTURE FROM EXPOSED SURFACES OF HOUSINGS, CASES, ~~CABINETS~~, CONTROL PANELS, ~~INPUT~~ ~~CONNECTING PLUGS~~, CABLES, ~~HEADSETS~~, METER WINDOWS, ETC. | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | | | | |
| 2. | INSPECT FOR LOOSENESS OF EXTERIOR ITEMS SUCH AS SWITCHES, KNOBS, JACKS, CONNECTORS, ~~AND PILOT LIGHTS~~. | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | | | | |
| 3. | INSPECT CONTROLS FOR BINDING, SCRAPING. TAP CONTROLS LIGHTLY FOR CUT-OUT DUE TO LOOSE CONTACTS. | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | | | | |
| 4. | DURING OPERATION BE ALERT FOR ANY UNUSUAL PERFORMANCE OR CONDITION. | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | | | | |

| WEEKLY | CONDITION EACH WEEK 1ST | 2D | 3D | 4TH | 5TH | 2D 3D ECH |
|---|---|---|---|---|---|---|
| 5. INSPECT CORDS, CABLES, ~~WIRE~~ AND SHOCK MOUNTS FOR BREAKS, CUTS, KINKS, DETERIORATION, STRAIN AND FRAYING. | ✓ | | | | | |
| 6. ~~INSPECT CANVAS AND LEATHER ITEMS FOR FUNGUS, FRAYING, TEARS, BROKEN ZIPPERS AND SNAP FASTENERS.~~ | | | | | | |
| 7. HAND CHECK FOR LOOSENESS OF EXTERIOR ITEMS SUCH AS HANDLES, LATCHES, ~~HINGES~~. | ✓ | | | | | |
| 8. ~~INSPECT FOR LUBRICATION IN ACCORDANCE WITH APPLICABLE DA LUBRICATION ORDER~~. | | | | | | |
| 9. ~~INSPECT DRY BATTERIES FOR DIRT, LOOSE TERMINALS AND LEAKAGE~~. | | | | | | |
| 10. INSPECT EXPOSED METAL SURFACES FOR RUST AND CORROSION. | ✓ | | | | | |
| 11. INSPECT METERS FOR DAMAGED GLASS, ~~AND CASES~~. | ✓ | | | | | |

| ADDITIONAL ITEMS FOR 2D AND 3D ECHELON INSPECTIONS | CONDITION |
|---|---|
| 12. ~~INSPECT SEATING OF READILY ACCESSIBLE ITEMS OF A PLUG-IN NATURE; CRYSTALS, FUSES, CONNECTORS, PLUG-IN COILS, LAMPS, ETC. DO NOT REMOVE, ROCK OR TWIST TO INSPECT. USE ONLY A DIRECT PRESSURE TO INSURE THE ITEM IS FULLY SEATED~~. | |
| 13. ~~INSPECT FOR CLEANLINESS AND TIGHTNESS OF SUCH ITEMS AS SHOCK MOUNTS, ANTENNA, ANTENNA MOUNTS AND WAVE GUIDES~~. | |
| 14. ~~INSPECT RELAY AND CIRCUIT BREAKER ASSEMBLIES FOR DIRT, CORROSION, WORN OR BURNED CONTACTS~~. | |

| ADDITIONAL ITEMS FOR 2D AND 3D ECHELON INSPECTIONS | CONDITION |
|---|---|
| 15. ~~INSPECT RESISTORS, BUSHINGS, INSULATORS FOR CRACKS, CHIPPING, BLISTERING, DISCOLORATION AND MOISTURE~~. | |
| 16. ~~INSPECT JACKS AND CONNECTORS FOR SNUG FIT AND GOOD CONTACTS~~. | |
| 17. ~~INSPECT VARIABLE CAPACITORS FOR DIRT AND MOISTURE~~. | |
| 18. ~~INSPECT AIR FILTERS FOR CLEANLINESS~~. | |
| 19. ~~INSPECT SCREW-TYPE TERMINALS OF TRANSFORMERS, FIXED CAPACITORS, RESISTORS, CHOKES, POTENTIOMETERS AND RHEOSTATS FOR CORROSION, DIRT AND LOOSE CONTACTS~~. | |
| 20. ~~CLEAN AND TIGHTEN SWITCHES, BLOWERS, RELAY CASES; CLEAN INTERIOR OF CHASSIS AND CABINETS~~. | |
| 21. ~~INSPECT GENERATORS, MOTORS AND DYNAMOTORS FOR BRUSH WEAR, SPRING TENSION, ARCING AND COMMUTATOR WEAR~~. | |
| 22. ~~INSPECT TERMINAL BLOCKS FOR LOOSE CONNECTIONS, CRACKS AND BREAKS~~. | |
| 23. ~~INSPECT GASKETS AND BUSHINGS FOR WEAR AND DAMAGE~~. | |
| 24. ~~INSPECT CATHODE RAY TUBES FOR BURNED SCREEN SPOTS~~. | |
| 25. ~~BEFORE STORING OR SHIPPING - REMOVE ALL BATTERIES~~. | |

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

2 3

*Figure 10. DA Form 11-266, pages 2 and 3.*

## 25. Troubleshooting

*a.* When the test set fails to perform properly, check the items listed below.

(1) Fuseholder (missing or burned-out fuses).

(2) Test cords (poor or erroneous connections).

(3) Controls (erroneous settings).

*b.* If a check of the items in *a*(1) through (3) does not locate the trouble, notify organizational maintenance personnel.

## 26. Replacement of Fuse

A 1/8-ampere, 125-volt fuse, type F02DR-125B (Federal stock No. 5920-189-9855) must be used in Test Set I-181-(*). Be sure to use the correct fuse when a new fuse is installed. Some other fuses with the same rating are not the proper length or have a higher resistance, which is objectionable when the test set is used as a milliammeter. The fuse is located in the fuse extractor post attached to the underside of the cap marked FUSE. On some procurements of the test set, this cap screws into place; on other procurements, the cap is secured by a spring-loaded twist lock. To replace the fuse, proceed as follows:

*a.* Unscrew or twist the cap and remove the cap and fuse extractor post.

*b.* Pull the fuse from the clip of the extractor and press a new fuse into the clip.

*c.* Push the fuse and fuse extractor post firmly into the receptacle and screw or twist the cap securely into place. Be sure to screw down screw-type caps to the end of the thread travel.

# CHAPTER 4

# DEMOLITION TO PREVENT ENEMY USE

## 27. Authority for Demolition

The demolition procedures outlined in paragraph 28 will be used to prevent the enemy from using or salvaging this equipment. Demolition of the equipment will be accomplished only upon order of the commander.

## 28. Methods of Destruction

*a. Smash.* Smash the milliammeter and all the other parts on both the face and the back of the panel; use sledges, axes, hammers, crowbars, or any other heavy tools available.

*b. Cut.* Cut the test cords and all wiring; use cutting pliers, bayonets, machetes, or handaxes.

*c. Burn.* Burn all cords, wiring, circuit and wiring diagrams, and technical manuals; use gasoline, kerosene, oil, flame throwers, or incendiary grenades.

*d. Bend.* Bend the panel, the case, and the cover.

*e. Explode.* If explosives are necessary, use firearms, grenades, or TNT.

*f. Dispose.* Bury the destroyed parts in slit trenches or foxholes, or throw them into streams.

APPENDIX

OPERATOR MAINTENANCE REPAIR PARTS AND SPECIAL TOOLS LIST

FOR

TEST SET I-181; I-181-A,B

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Section I. PREFACE

1. General

a. This appendix lists items supplied for initial operation and for running spares and accessories. The list includes tools, accessories and similar material issued as part of the major end item. This portion lists the basic allowance data for parts and accessories required for maintenance of TEST SET I-181; I-181-A,B. These equipments are issued on the basis of allowances prescribed in equipment authorization tables and other documents which are a basis for requisitioning.

b. The lists in Section II are presented in columns titled as follows:

(1) FEDERAL OR TECHNICAL SERVICE STOCK NUMBER. The stock number column lists the 11 digit Federal stock number assigned by the Cataloging Division, OASD(S&L). In the absence of a Federal stock number, the technical service stock number will be used for requisitioning purposes.

(2) SOURCE CODE. Repair parts source, maintenance and recoverability code symbols provide information on the use and availability of repair parts according to their functional application. The following are source code repair parts definitions in accordance with AR 700-18.

(a) Technical Service Supply Sources Code. 11 indicates a stock Signal Corps part. Refer to AR 310-2 for Technical Service identifying number.

(b) The most efficient and practical source or method of supply for the part.

1. Code "P" is applied to repair parts which are high mortality parts; procured by technical services, stocked in and supplied from the technical service depot system, and authorized for use at indicated maintenance echelons.

2. Code "P1" is applied to repair parts which are low mortality parts; procured by technical services, stocked only in and supplied from technical service key depots, and authorized for installation at indicated maintenance echelons.

(c) The lowest maintenance echelon authorized to install the repair part.

1. "O" Organizational Maintenance (1st and 2nd echelon).
2. "F" Field Maintenance (3rd echelon).
3. "H" Field Maintenance (4th echelon).
4. "D" Depot Maintenance (5th echelon).

(d) The recoverability aspects of the part. (Will be listed only when applicable).

1. Code "R" Repairable. Applied to repair parts and assemblies which are economically repairable and, when available, are furnished by supply on an exchange basis.

2. Code "S" Salvageable. Applied to repair parts which may be placed in "Ready for Issue" condition by cleaning, replating, anodizing, adjusting, welding, etc.

(3) DESIGNATION BY MODEL. This column appears whenever the Section lists parts for two or more models of a particular equipment or when differences in the same model occur. A dagger (†) appearing in the column indicates the model in which the part is used.

(4) DESCRIPTION. Nomenclature or the standard item name and brief identifying data for each item is listed in this column. When requisitioning, enter the nomenclature and description on the requisition.

(5) UNIT OF ISSUE. The unit of issue is the supply medium by which the individual item is counted for procurement, storage, requisitioning, allowances and issue purposes.

(6) EXPENDABILITY. Expendable items are indicated by the letter X; nonexpendable items are indicated by NX.

(7) QUANTITY AUTHORIZED. Under "Items Comprising an Operable Equipment" the column lists the quantity of items supplied for the initial operation of the equipment. Under "Running Spares and Accessories" the quantities listed are those issued initially with the equipment as spare parts. The quantities are authorized to be kept on hand by the operator for maintenance of the equipment.

(8) ILLUSTRATION. The illustration columns refer to either the diagrams or illustrations in which the item appears. References appearing in the Item No. Column are a combination of signs or symbols used for identification of the items appearing in illustrations or schematic diagrams shown in another portion of this manual, supplemental circuit labels or technical bulletins.

2. References

A Maintenance Allocation Chart showing all repair operations authorized to be performed by the respective echelons of maintenance appears in TM 11-6625-202-20, Appendix II.

3. Abbreviations

amp - ampere
cond - conductor
ins - insulator
Spec - Specification
WECo - Western Electric Co.

4. Comments or Suggestions

Any comments concerning omissions and discrepancies in this appendix will be prepared on DA Form 2028 and forwarded directly to Commanding Officer, U. S. Army Signal Equipment Support Agency, Fort Monmouth, New Jersey, Attn: SIGFM/ES-ML.

| (1) FEDERAL OR TECHNICAL SERVICE STOCK NUMBER | (2) REPAIR PARTS SOURCE, MAINTENANCE AND RECOVERABILITY CODE | (3) DESIGNATION BY MODEL 1 | 2 | 3 | 4 | 5 | (4) DESCRIPTION | (5) UNIT OF ISSUE | (6) EXPENDABILITY | (7) QUANTITY AUTHORIZED | (8) ILLUSTRATION FIGURE NO. | (9) ILLUSTRATION ITEM NO. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | ITEMS COMPRISING AN OPERABLE EQUIPMENT | | | | | |
| | | | | | | | TEST SET I-181; I-181-A,B | | | | | |
| | | | | | | | NOTE: Model Column 1 refers to I-181; Column 2 refers to I-181-A; Column 3 refers to I-181-B, Order Nos. 9029-PH-49, 14525-PH-49, 23390-PH-50; Column 4 refers to I-181-B, Order No. 3533-PH-52; Column 5 refers to I-181-B, Order No. 21507-PH-56. | | | | | |
| 6625-229-1042 | | | | | | | TEST SET I-181; I-181-A,B: for testing relays; 8-3/4 in lg x 5-1/8 in w x 5-1/8 in h | ea | NX | | | |
| 5920-189-0855 | | † | † | † | † | † | FUSE, CARTRIDGE: 0.125 amp, 125 v; Littelfuse No. 313.125 | ea | X | 1 | | F1 |
| 5995-162-0858 | | † | † | † | † | † | CORD ASSEMBLY, ELECTRICAL: 1 tinsel cond, rubber ins; 6 ft lg excluding terminations; WECo type 360A connector ea end; WECo No. 1W13B per US Army Spec No. 71-151, class B | ea | X | 1 | | |
| 5995-194-8040 | | † | † | † | † | † | CORD ASSEMBLY, ELECTRICAL: 2 tinsel, rubber insulated individual cond 6-1/2 ft lg o/a; WECo No. 310 | ea | X | 1 | | |
| | | | | | | | RUNNING SPARES AND ACCESSORY ITEMS | | | | | |
| | | | | | | | TEST SET I-181; I-181-A,B | | | | | |
| 5920-189-0855 | | † | † | † | † | † | FUSE, CARTRIDGE: 0.125 amp, 125 v; Littelfuse No. 313.125 | ea | X | 5 | | |

[AG 413.44 (24 Jun 58)]

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

MAXWELL D. TAYLOR,
*General, United States Army,*
*Chief of Staff.*

OFFICIAL:
HERBERT M. JONES,
*Major General, United States Army,*
*The Adjutant General.*

THOMAS D. WHITE,
*Chief of Staff, United States Air Force.*

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J. L. TARR,
*Colonel, United States Air Force,*
*Director of Administrative Services.*

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*Active Army:*
ASA (2)
CNGB (1)
Technical Stf, DA (1) except
CSigO (30)
Technical Stf Bd (1)
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USA Arty Bd (1)
USA Armor Bd (Incl ea Test Sec) (1)
USA Inf Bd (1)
USA Air Def Bd (Incl ea Test Sec) (1)
USA Abn & Elct Bd (1)
USA Avn Bd (1)
USA Arctic Test Bd (1)
US ARADCOM (Incl ea Rgn Comd) (2)
OS Maj Comd (5)
Log Comd (5)
MDW (1)
Armies (5)
Corps (2)
Div (2)
Ft & Camp (2)
Svc College (5)
Br Svc Sch (5) except
USASCS (25)
Gen Depots (2) except
Atlanta Gen Depot (None)
Sig Sec, Gen Depot (10)
Sig Depot (17)
Port of Emb (OS) (2)
OS Sup Agcy (2)
Sig Fld Maint Shop (3)
Sig Lab (5)
USA Sig Pub Agcy (8)
Army Pictorial Cen (2)
USASSA (Phila, Pa) (13)
Sp Wpn Comd (5)
White Sands Sig Agcy (13)
USA Elct PG (1)
Dugway PG (5)
Jefferson PG (5)
USA Com Agcy (2)
Red River Arsenal (5)
WRAMC (1)
USAMS (1)
Engr Maint Cen (1)
AFIP (1)
USA Sig Com Engr Agcy (1)
Mil Dist (1)
USA Corps (Res) (1)
Sectors, USA Corps (Res) (1)
JBUSMC (2)
Units org under the fol TOE:
9-500 (AA-AC) (2)
11-7 (2)
11-15 (2)
11-16 (2)
11-18 (2)
11-57 (2)
11-95 (2)
11-97 (2)
11-127 (2)
11-128 (2)
11-500 (AA-AE) (2)
11-557 (2)
11-587 (2)
11-592 (2)
11-597 (2)
39-51 (2)
39-61 (2)
39-71 (2)
44-12 (2)
44-101 (2)

*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 320-50.

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