



Figure 1. Test Set, Electron Tube TV-2(*)/U, less running spares.

CHAPTER 1

INTRODUCTION

Section I. GENERAL

1. Scope

a. This manual describes Test Sets, Electron Tube TV-2/U, TV-2A/U, and TV-2B/U (fig. 1) and covers operation and the operator's and organizational maintenance. It includes instructions for operation under usual conditions, for cleaning and inspection of the equipment, and for replacement of parts available to first and second echelon maintenance.

b. Official nomenclature followed by (*) is used to indicate all models of the equipment item covered in this manual. Thus Test Set, Electron Tube TV-2(*)/U represents Test Sets, Electron Tube TV-2/U, TV-2A/U, and TV-2B/U.

c. Throughout this manual, Test Set, Electron Tube TV-2(*)/U is referred to as the *tube tester*.

2. Forms and Records

a. *Unsatisfactory Equipment Report*. Fill out and forward DD Form 787-1 (Electronic Failure Report, Signal Equipment) to the Commanding Officer, U.S. Army Signal Materiel Support Agency, ATTN: SIGMS-ML, Fort Monmouth, N.J., as prescribed in AR 700-39.

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.

c. *Preventive Maintenance Forms*. Prepare DA Form 11-266 (figs. 6, 7, and 9) (Maintenance Check List for Signal Equipment (Test Equipment)) in accordance with instructions on the form.

d. *Parts List Form*. Forward DA Form 2028 (Recommended Changes to DA Technical Manual Parts Lists or Supply Manuals 7, 8, or 9), directly to the Commanding Officer, U.S. Army Signal Materiel Support Agency, ATTN: SIGMS-ML, Fort Monmouth, N.J., with comments on parts listings.

e. *Comments on Manual*. Forward all other comments on this publication directly to the Commanding Officer, U.S. Army Signal

Materiel Support Agency, ATTN: SIGMS-PA2d, Fort Monmouth,
N.J.

Section II. DESCRIPTION AND DATA

3. Purpose and Use

Test Set, Electron Tube TV-2(*)/U (fig. 1) is a portable tube tester of the dynamic mutual conductance type. It is used to test and to measure performance capabilities and to determine rejection limit for electron tubes used in receivers, low-powered transmitters, and other electronic equipment. The following tests can be made with the tube tester.

- a. Short test.
- b. Interelement leakage test.
- c. Filament continuity test.
- d. Dynamic mutual conductance test for amplifier tubes.
- e. Gas test for amplifier tubes.
- f. Emission test for vacuum rectifier tubes.
- g. Test of gas rectifier tubes.
- h. Test of voltage regulator tubes.
- i. Plate current tests for triodes.
- j. Test of thyatron tubes.
- k. Electron-ray indicator test for electronic indicator tubes.
- l. Ballast tube test.

4. Technical Characteristics

a. Power supply:

Input voltage..... 103.5 to 126.5 volts ac.
Frequency..... 50 to 1,000 cps, single-phase.
Power consumption..... 70 watts (no tube under test).
Temperature range..... Satisfactory operation from -4° F. to 125° F.

b. Meters:

FILAMENT VOLTS meter:

Type..... Dc voltmeter movement.
Frequency range..... 50 to 1,000 cps.
Ac voltage ranges..... 0 to 2.5 volts, 0 to 10 volts, 0 to 40 volts, and
0 to 120 volts. Redlines at 0.625, 6.3, 12.6,
and 117 on appropriate scale.
Accuracy..... ± 5 percent error at full scale.

GRID BIAS VOLTS meter:

Type..... Dc voltmeter.
Sensitivity..... 1,000 ohms per volt.
Dc voltage ranges..... 0 to 5 volts, 0 to 10 volts, and 0 to 50 volts.
Accuracy..... ± 2 percent error at full scale.

PLATE meter:

Type..... DC voltmeter.
 Sensitivity..... 1,000 ohms per volt.
 Voltage ranges..... 0 to 250 volts dc, with redlines at 45, 90, 180,
 and 225.
 0 to 50 volts ac, with 20 AC and 35 AC marked
 in red.
 Ohmmeter ranges..... 0.1 to 1.0 megohms.
 Accuracy..... ±2 percent error at full scale.

SCREEN VOLTS meter:

Type..... Dc voltmeter.
 Sensitivity..... 1,000 ohms per volt.
 Voltage range..... 0 to 250 volts dc.
 Accuracy..... ±2 percent error at full scale.

SIGNAL meter:

Type..... Ac iron vane-type ammeter.
 Frequency range..... 50 to 1,000 cps.
 Meter range..... 45 ma ac full scale; redline at approximately
 two-thirds full scale (35 ma ac).
 Accuracy..... ±5 percent error at full scale.

PERCENT QUALITY meter (transconductance):

Type..... Dc microammeter.
 Sensitivity..... 10,000 ohms per volt (150 microamperes full-
 scale deflection).
 Percent quality ranges..... To 60,000 micromhos (in equivalent percentage
 values).
 Accuracy..... ±2 percent error at full scale.

c. Number of electron tubes 3

5. Components of Test Set, Electron Tube TV-2(*)/U

a. Components.

Quantity	Item	Height (in.)	Depth (in.)	Width (in.)	Unit weight (lb)
1	Test Set, Electron Tube TV-2(*)/U	8 $\frac{3}{8}$	16 $\frac{1}{8}$	17 $\frac{1}{8}$	37
2	TM 11-6625-316-12				
1	9-pin miniature tube straightener				
1	7-pin miniature tube straightener				
1 set	Running spares (b below)				

b. Running Spares.

Quantity	Item	Ref symbol
1	Electron tube, 83.....	V1
1	Electron tube, 6X4W.....	V2, V3
5	Fuses, 3 ampere, 250 volts, ¼ x 1¼ inches.	F1, F2
1	Glowlamp, NE-51.....	11C, 12C

Note. Running spares listed above are stored in designated positions on the inside cover and chassis (figs. 1 and 8) of the tube tester.

6. Description of Test Set, Electron Tube TV-2(*)/U (fig. 1)

a. Test Set, Electron Tube TV-2(*)/U (tube tester) is housed in a carrying case equipped with a carrying handle, two electrical clips for connection to the top cap of a tube under test, operating and spare tubes, fuses, indicating lamps, and miniature tube pin straighteners. The cover is secured to the case by luggage-type fasteners. Power cord brackets and a dummy power cord receptacle on the panel are used to secure and store the power cable. Tube test data is given on a roll chart; the roll chart case is mounted inside the cover of the tube tester. A condensed summary of operating instructions also is mounted inside the cover of the tube tester. The cover is hinged by slip hinges and can be removed from the case. Two handles attached to the panel permit easy lifting of the tube tester from the case.

b. All indicating meters, switches, controls, and tube test sockets are located on the panel of the equipment. The necessary data for setting and operating the controls to test the various tube types are contained in the tube test data roll chart (a above). Two electrical clips (A and B, fig. 3) provide connection to external caps of tubes as required. One end of the power cord is permanently attached to the panel; the other end terminates in a male plug.

7. Differences in Models

Test Sets, Electron Tube TV-2/U, TV-2A/U, and TV-2B/U are similar in purpose, operation, and appearance. On some equipments, the FUNCTION switch and the FIL. CONT. SHORT lamp are marked LEAKAGE VR and SHORT, respectively. Other external differences among models of the tube tester are shown below.

Tents sets, electron tube

Item	TV-2/U	TV-2A/U	TV-2B/U
GM CENTERING control.	Dot index markings on knob and panel.	Line index markings on knob and panel.	Line index markings on knob and panel.
PLATE fine control	Round, fluted knob; dot index markings on knob and panel.	Pointer-type knob; line index marking on panel.	Pointer-type knob; line index marking on panel.
Test adapters	X13B used	X13B used	X3B, X7B, X10B, and X13B used.
Antiparasitic ferrite beads.	Not included	Not included	Included.
PERCENT QUALITY meter.	Interchangeable with TV-2A/U	Interchangeable with TV-2/U	Not interchangeable with previous models.