DEPARTMENT OF THE ARMY TECHNICAL MANUAL

DEPARTMENT OF THE AIR FORCE TECHNICAL ORDER

TM 11-6625-303-35

TO 33A1-5-72-2

FIELD AND DEPOT MAINTENANCE

ELECTRICAL POWER TEST SETS

AN–UPM-93 AND AN-UPM-100

This copy is a reprint which includes current pages from Change 1.

DEPARTMENTS OF THE ARMY AND THE AIR FORCE

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DEPARTMENTS OF THE ARMY
AND THE AIR FORCE
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ELECTRICAL POWER TEST SETS AN-UPM-93 AND AN-UPM-100

*This manual, together with TM 11-6625-303-12, 10 July 1959, supersedes TB SIG 318, 24 March 1958.

CHAPTER 1

THEORY

1. Scope

a. This manual covers field and depot maintenance for Electrical Power Test Sets AN/UPM-93 and AN/UPM-100. It includes instructions appropriate to third, fourth, and fifth echelons for troubleshooting, testing, and repairing the equipment, and replacing maintenance parts. It also lists tools, materials, and test equipment for third, fourth, and fifth echelon maintenance.

b. The complete technical manual for this equipment includes one other publication, TM 11-6625-303-12, Electrical Power Test Sets AN/UPM-93 and AN/UPM-100, Operation and Organizational Maintenance.

c. Forward comments concerning this manual to the Commanding Officer, U. S. Army Signal Publication Agency, Fort Monmouth, N. J.

Note. For applicable forms and records, see paragraph 2, TM 11-6625-303-12.

Item	TS-934/U	TS-914/U
Voltmeter	Measures 380 to 420-cps input.	Measures 58 to 62-cps input.
Frequency meter	Vibrating reeds have a resonant frequency of 380 to 420-cps.	Vibrating reeds have a resonant frequency of 58 to 62-cps.

2. Internal Differences in Models

Internal differences are listed in the chart below. For external differences, see TM 11-6625-303-12.

3. Voltmeter Theory

a. The input voltage is applied directly across voltmeter terminals P1 and P2 (fig. 1). Resistors R1 and R2 are meter multipliers. Resistor R1 is always in the circuit; resistor R2 can be switched in or out of the circuit by switch S1.

(1) When switch S1 is in the 150 position, resistor R2 is shorted out and the input voltage is applied to the voltmeter meter movement and resistor R1. Resistor R1, which is in series with the meter movement, limits the current in the circuit to the amount needed for full scale deflection at 150 volts.

(2) When selector switch S1 is in the 300 position, meter multiplier resistor R2 is connected in series with resistor R1 and the meter movement, thereby increasing the voltmeter range from 150 volts to a maximum of 300 volts.

b. Current through the stator coils of the meter movement (fig. 1 and 2) sets up a magnetic field. The rotor assembly, which is free to turn in the magnetic field, is displaced by the field. As current changes through the stator coils, the strength of the magnetic field also changes. The change in field strength repositions the rotor assembly. The voltmeter pointer is attached to the rotor assembly, and, as the rotor assembly moves in the field, the pointer indicates the amount of voltage applied to the tester. The zero adjustment pin (not shown), which fits between the arms of the zero adjust crank (fig. 2), permits the tension on the rotor assembly springs to be varied when adjusting the pointer for a zero indication (TM 11-6625-303-12).

4. Frequency Meter Theory

a. The output of the power circuit being tested is applied directly across the frequency meter (fig. 1). Resistors R3 and R4 and the

frequency meter coil are connected in series with each other, but in parallel with the voltmeter circuit. Resistor R3 is always in the circuit; resistor R4 can be switched in or out of the circuit by switch S1.

(1) When switch S1 is in the 150 position, resistor R4 is shorted out and the meter current flows through resistor R3 and the frequency meter coil.

(2) When switch S1 is in the 300 position, resistor R4 is placed in series with resistor R3 and the frequency meter coil to limit the current flow in the circuit.

b. Current flow through the coil assembly if the frequency meter sets up a magnetic field. A reed assembly is mounted in this field. Each reed has a resonant frequency and shows maximum vibration at that frequency only. The frequency of the current in the coil assembly causes the reed resonant to the frequency to vibrate. This vibrating reed indicates the frequency of the power circuit. If the frequency being measured has a value midway between two adjacent reeds, both reeds will vibrate, but neither to its maximum amplitude. The power circuit frequency is then of a value halfway between the two vibrating reeds (fig. 4, TM 11-6625-303-12).

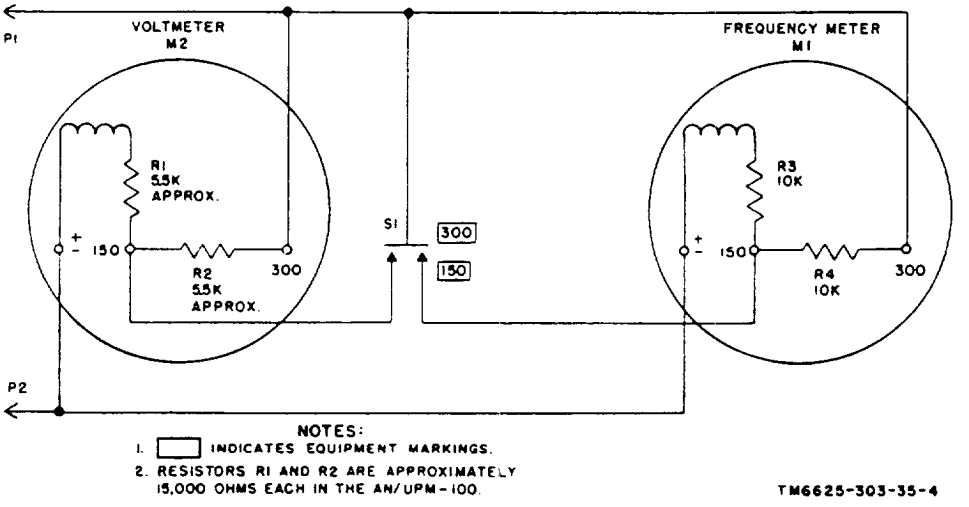

Figure 1. Schematic diagram.