

DEPARTMENT OF THE ARMY TECHNICAL MANUAL

FIELD AND DEPOT MAINTENANCE MANUAL

TEST SET, ELECTRICAL
METER TS-656/U

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current pages from Change 1.

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Technical Manual

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TEST SET, ELECTRICAL METER TS-656/U

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CHAPTER 1 THEORY

Section I. BLOCK DIAGRAM ANALYSIS

1. Scope

a. This manual covers field and depot maintenance for Test Set, Electrical Meter TS-656/U. It includes instructions appropriate to third, fourth, and fifth echelons for troubleshooting, testing, adjusting and repairing the equipment, replacing maintenance parts, and repairing specified maintenance parts. It also lists tools and test equipment for third, fourth, and fifth echelon maintenance. Detailed functions of the equipment are covered in paragraphs 2 through 8.

b. Operation and Organizational Maintenance for this equipment is included in TM 11-6625-226-12.

c. Forward comments concerning this manual to the, Commanding Officer, U. S. Army Signal Materiel Support Agency, ATTN: SIGMS-PA2d, Fort Monmouth, N.J.

Note

**For applicable forms and records,
see paragraph 2, TM 11-6625-226-12.**

2. DC VOLTS Circuit Block Diagram Analysis (fig. 1)

a. *Input Circuit.* The input power (115 volts, 60 cycles per second (cps)) is applied to ON-OFF switch S4. With ON-OFF switch S4 in the OFF position, the alternating current (ac) power is applied to the heater. The heater maintains the internal components of the tester at a constant temperature and keeps the humidity low when the tester is in the standby condition (connected to power, but not being operated). With ON-OFF switch S4 in the ON position, the heater is disconnected and the input power is applied to variable transformer T2. The output power of variable transformer T2 (variable from 0 to approximately 115 volts ac) is applied to power transformer T1.

b. *Dc Voltage Circuit.* The ac output voltage of power transformer T1 is applied to the bridge rectifier which consists of diodes CR3 through CR10. The rectified output of the bridge rectifier is filtered and then applied to the voltage divider which consists of resistors R6 through R11. The direct current (dc) voltage output range is selected from the voltage divider by VOLTAGE range switch S1 and then applied to the output jacks and to meter M1. The desired dc voltage output is obtained by the adjustment of variable transformer T2. This action adjusts the input voltage to power transformer T1 and, in turn, the voltage applied to the voltage divider, the output jacks, and meter M1.

3. DIR CUR Circuit Block Diagram Analysis (fig. 2)

a. *Input Circuit.* The input circuit for the DIR CUR circuit is the same as that for the DC VOLTS circuit (para 2a).

b. *Dc Current Circuit.* The ac output voltage of power transformer T1 is applied to the rectifier which consists of diodes CR1 and CR2. The rectified output current of diodes CR1 and CR2 is filtered and then applied to current-limiting resistors R41 through R53. The current-limiting resistors determine the *maximum* dc current available at the output jacks. From the current-limiting resistors, the dc current is applied to sections A and B of CURRENT range switch S5. CURRENT range switch S5 selects the dc current output range and arranges the shunt and multiplier resistors for that range and for meter M1. Meter M1 indicates the value of the dc current output. The desired dc current output is obtained by the adjustment of variable transformer T2. This action adjusts the input voltage to power transformer T1 and, in turn, the current flow through the current-limiting resistors, the output jacks, and meter M1.

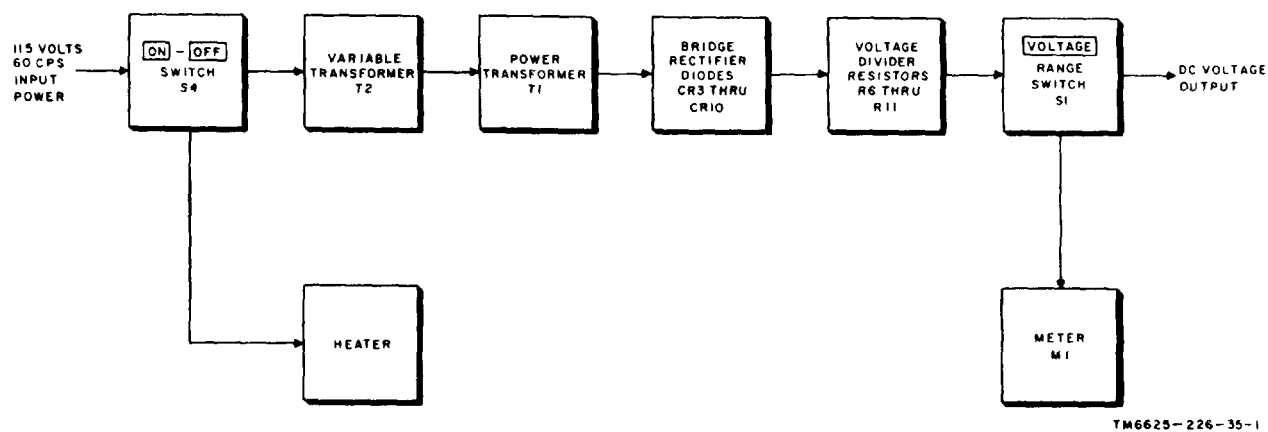


Figure 1. DC VOLTS circuit, block diagram.

4. AC VOLTS Circuit Block Diagram Analysis (fig. 3)

a. *Input Circuit.* The input circuit for the AC VOLTS circuit is the same as that for the DC VOLTS Circuit (para 2a).

b. *Ac Voltage Circuit.* The ac voltage output range of power transformer T1 is selected by section A of VOLTAGE range switch S1 and applied directly to the tester output jacks. The meter rectifier, which consists

of diodes CR11 through CR14, rectifies a portion of the output voltage of power transformer T1 and applies the resultant dc voltage to meter M1. Meter M1 is calibrated so that it indicates the ac voltage output. The desired ac voltage output is obtained by the adjustment of variable transformer T2. This action adjusts the input voltage to power transformer T1 and, in turn, the ac voltage selected by section A of VOLTAGE range switch S1.