

TM 11-6625-498-45
DEPARTMENT OF THE ARMY TECHNICAL MANUAL

**FIELD (FOURTH ECHELON) AND DEPOT
MAINTENANCE MANUAL**

**TEST SET, RADIO FREQUENCY
POWER AN/USM-161**



HEADQUARTERS, DEPARTMENT OF THE ARMY
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TEST SET, RADIO FREQUENCY POWER AN/USM-161

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CHAPTER 1

THEORY

1. Scope

a. This manual covers field (fourth echelon) and depot maintenance for Test Set, Radio Frequency Power AN/USM-161 (test set). It includes instructions appropriate to fourth and fifth echelons for troubleshooting, repairing, alignment, and testing the test set. The repair and replacement of specified maintenance parts is also included. In addition, tools, materials, and test equipment for fourth and fifth echelon maintenance are listed. Detailed theory of the test set is covered in this chapter.

b. Throughout this manual Test Set, Radio Frequency Power TS-1776/USM-161 (the major component of the test set) is referred to as power meter.

c. The complete technical manual for this equipment includes TM 11-6625-498-12.

d. Forward all comments on this publication direct to: Commanding Officer, U. S. Army Electronics Materiel Support Agency, ATTN: SELMS-MP, Fort Monmouth, New Jersey. (DA Form 1598 (Record of Comments on Publications), DA Form 2496 (Disposition Form), or letter may be used.)

Note: For applicable forms and records, see paragraph 2, TM 11-6625-498-12.

e. Refer to the latest issue of DA PAM 310-4 to determine whether there are new editions, changes, or additional publications pertaining to your equipment. Department of the Army Pamphlet No. 310-4 is an index of current Technical Manuals, Technical Bulletins, Supply Bulletins, Lubrication Orders, and Modification Work Orders that are available through publications supply channels. The index lists the individual parts (-10, -20, -35P, etc) and the latest changes to and revisions of each equipment publication.

2. Block Diagram (fig. 1)

a. General. The test set is designed to measure radiofrequency (rf) power at fre-

quencies between 10 and 10,000 megacycles (mc). Each test set is supplied with a 200-ohm thermistor mount (Bolometer, Radio Frequency DT-255/USM-161 (thermistor mount)). One 7-decibel (db) Attenuator, Fixed CN-844/USM-161 and two 10-db Attenuators, Fixed CN-845/USM-161 are supplied with the test set to extend the maximum power measuring capabilities of the equipment. The frequency range of the attenuators is from 1,000 to 10,000 mc. The rf power (from 2 microwatts (uw) to 5 watts) being measured maybe continuous-wave, modulated, or pulsed power.

b. Rf Cable and Rf Cord. An input cable (rf cable) is permanently attached to the front panel, and connects the thermistor mount to the power meter. When the rf cable is not long enough, the rf cord can be used. This rf cord is 6 feet long and is connected from the rf power source to be measured to the thermistor mount (or attenuators, if required). Standard correction factors for deviations in attenuation introduced by the use of this rf cord are indicated on the calibration plate on the rf cord. It is recommended that the rf cord be used only when absolutely necessary.

c. Attenuators. The test set maybe used without attenuators to measure up to 10 milliwatts (mw) of rf power. With the three attenuators attached, the test set can measure up to 5 watts of rf power. The maximum power that may be applied to the 10-db attenuators is 1 watt, and to the 7-db attenuator, 5 watts. Therefore, when measuring more than 1 watt, the 7-db attenuator should be closest to the rf power source being measured.

d. Thermistor Mount. The 200-ohm thermistor mount supplied with the test set is the element used for measuring the rf power applied. Its resistance changes due to the heating caused by the rf energy applied. This change in resistance is sensed by the rf bridge circuit. Facilities are also contained in the test set for the use of a 100-ohm thermistor mount (not