TM 11-6625-400-35

DEPARTMENT OF THE ARMY TECHNICAL MANUAL

FIELD AND DEPOT MAINTENANCE MANUAL

METER, MODULATION ME-57/U

HEADQUARTERS, DEPARTMENT OF THE ARMY

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Technical Manual
No. 11-6625-400-35

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METER, MODULATION ME-57/U

CHAPTER 1

THEORY

Section I. GENERAL

1. Scope

a. This manual covers field and depot maintenance for Meter, Modulation ME-57/U. It includes instructions appropriate to fourth and fifth echelons for trouble-shooting, testing, aligning, and repairing specified maintenance parts. It also lists tools, materials, and test equipment for fourth and fifth echelon maintenance. Detailed circuit operation of the equipment is described in paragraphs 3 through 9.

Note: No maintenance functions are assigned to third echelon.

b. The complete technical manual for this equipment includes TM 11-6625-400-12.

c. Refer to DA Pamphlet 310-4 to determine what Changes to or revisions of this publication are current.

d. Forward comments concerning this manual to: Commanding Officer, U. S. Army Electronics Materiel Support Agency, ATTN: SELMS-MP, Fort Monmouth, N. J. (DA Form 1598 (Record of Comments on Publications), DA Form 2028 (Recommended Changes to DA Technical Manual Parts Lists or Supply Manual 7, 8, or 9), DD Form 96 (Disposition Form) or other suitable form or letter may be used.)

Note: For applicable forms and records, refer to paragraph 2, TM 11-6625-400-12.

2. Block diagram (fig. 1)

The modulation meter is used to measure deviation and carrier shift of frequency-modulated (fm) signal generators and transmitters. Signal paths are shown in figure 1 and discussed in a through 1 below. For complete circuit details, refer to the overall schematic diagram (fig. 32).

a. Oscillator V1. The oscillator is self-contained and is mounted on top of the chassis. It provides a signal to mix with the incoming radiofrequency (rf) signal. The modulation meter input frequency is covered in five ranges selected by the FREQUENCY RANGE-MC switch.

b. Mixer CR1. The mixer is mounted on the back of the oscillator. A crystal diode is used to mix the rf signal with the oscillator signal. The resulting intermediate frequency (if.) signal is fed to the if. amplifiers.

c. If. Amplifiers V2 Through V6. Five if. amplifiers use a combination of stagger tuning and broad bandpass to amplify the if. signal. Stages V2 through V5 have automatic volumn control (avc) applied to them. Stage V6 has no avc applied.

d. Limiters V7 and V8. Two limiter stages use high conductance-type pentodes to achieve limiting of the if. signal. These stages are stagger tuned and broad band type circuits. The limited signal is fed to the driver amplifier circuit.

e. LIMITING Meter M1. The LIMITING meter is fed from the first limiter stage. It indicates that the level of the rf input is sufficient for proper operation.

f. Driver Amplifier V9. The driver amplifier amplifies the limited if. signal to the level required for optimum discriminator operation.

g. Discriminator T9. The discriminator converts the frequency-modulated if, signal to voltages corresponding to the amount of modulation applied to the signal. The discriminator output is fed to CARRIER SHIFT meter M2 and audio circuits.

h. CARRIER SHIFT Meter M2. Meter M2 is a zero-center meter that indicates the amount of carrier shift caused by the modulation of the rf signal. Readings are in kilocycles (kc).

i. Divider Network. This precision divider is used to select the amount of signal required for full-scale readings on the