

# **TM 11-6625-353-35**

**DEPARTMENT OF THE ARMY TECHNICAL MANUAL**

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**FIELD AND DEPOT MAINTENANCE MANUAL**

**AMPLIFIER RADIO FREQUENCY  
AM-1881/U**



**HEADQUARTERS, DEPARTMENT OF THE ARMY  
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## AMPLIFIER, RADIO FREQUENCY AM-188/U

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# CHAPTER 1

## THEORY

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### 1. Scope

a. This manual covers field and depot maintenance for Amplifier, Radio Frequency AM-1881/U. It includes instructions appropriate to fourth and fifth echelons for troubleshooting, testing, adjusting, and repairing the equipment, and replacing maintenance parts. It also lists tools, materials, and test equipment for fourth and fifth echelon maintenance. Detailed functions of the equipment are covered in the theory section.

*Note.* There are no maintenance functions assigned to third echelon.

b. The complete technical manual for this equipment includes three other publications:

TM 11-6625-353-12, TM 11-6625 -353-20P, and TM 11-6625-353-35P.

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 11-6625-353-12.

### 2. Block Diagram

The AM-1881/U is a general-purpose wide frequency range (5 cycles per second (cps) to 2 megacycles (mc)) amplifier. The signal path is shown in the block diagram (fig. 1) and is discussed in a through c below. For complete circuit details, refer to the overall schematic diagram, figure 12.

a. *First and Second Amplifiers and Cathode Follower.* The AM-1881/U amplifier section consists of two stages of voltage amplification (V1 and V2) connected in cascade, a cathode follower output stage (V3), and a negative feedback network. Pentode tubes are used in all three stages. Amplifiers V1 and V2 provide high gain and wide-frequency bandwidth with low-noise level. Negative feedback to V1 is used to stabilize gain, increase band-

width, and reduce noise and distortion. The negative feedback is adjustable to control gain and frequency response. The input signal is applied to the grid of first rf amplifier V1 where it is amplified and coupled to the grid of V2. The signal is further amplified by V2 and coupled to the grid of V3. Cathode follower V3 presents a relatively low impedance to external loads.

b. *Negative Feedback Network.* Negative feedback from the output of V3 is fed to the cathode of V1 through a resistor voltage divider network. The gain of the amplifier is controlled by a two-position GAIN switch (20 DB or 40 DB) that controls the amount of feedback to V1. Frequency response of the amplifier is also controlled by the negative feedback network.

c. *Power Supply.* The power supply is electronically regulated to stabilize operation during changes in line voltage and load conditions. It consists of power transformer T1, power rectifier V4, series regulator V5, regulator control V6, and voltage reference stage V7. The series regulator stage output is taken from the cathode and supplies the regulated output direct-current (dc) voltage. The gaseous OA2 voltage reference tube supplies a stable reference voltage to V6 against which a sample of the output voltage is compared. The regulator control tube amplifies any change in the difference between the sample output voltage and the reference voltage, and applies it to the series regulator control grid. This action holds the output voltage constant at +210 volts dc.

### 3. Stage Analysis

a. *First Amplifier (fig.2).* The first amplifier, V1, is a type-5654 pentode voltage amplifier tube. The input signal is applied to the control grid and the negative feedback signal is applied to the cathode. Capacitor C1 blocks any dc component

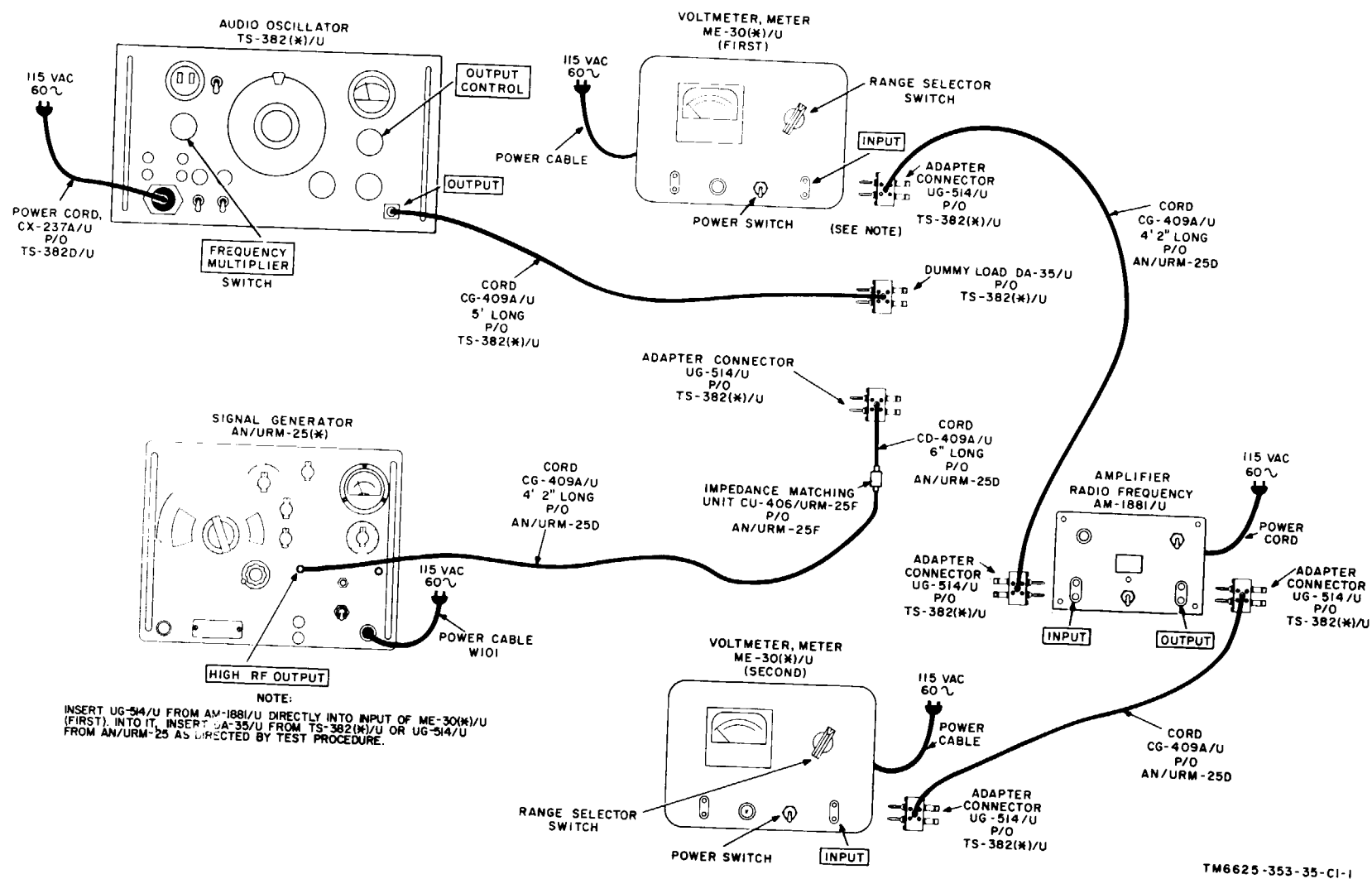


Figure 8.1 Gain and Frequency response test setup.