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DEPARTMENT OF THE ARMY TECHNICAL MANUAL

GS AND DEPOT MAINTENANCE MANUAL

FOR

GENERATOR, SINGAL SWEEP AN/USM-203

HEADQUARTERS, DEPARTMENT OF THE ARMY
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GENERATOR, SIGNAL SWEEP AN/USM-203

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CHAPTER 1

FUNCTIONING OF EQUIPMENT

1-1. scope

a. This manual contains GS and depot maintenance instructions for Generator, Signal Sweep AN/USM-203. It includes instructions appropriate to G3 and depot repairmen for troubleshooting, testing, aligning, and repairing the equipment. It also lists tools, materials, and test equipment required for GS and depot maintenance. Functional analysis of the equipment is covered in this chapter.

b. The complete manual for this equipment includes TM 11-6625-1559-12, TM 11-6625-1559-45/2, and TM 11-6625-1559-45P. TM 11-6625-1559-45/2 contains all the illustrations for this manual and TM 11-6625-1559-45P.

c. The reporting of errors, omissions, and recommendations for improving this publication by the individual user is encouraged. Reports should be submitted on DA Form 2028 (Recommended Changes to Publications) and forwarded direct to Commanding General, U.S. Army Electronics Command, ATTN: AMSEL-ME-NMP-EM, Fort Monmouth, N.J. 07703.

NOTE

For other applicable forms and records, refer to paragraph 1-3, TM 11-6625-1559-12.

1-2. Indexes of Equipment Publications

a. *DA Pam 310-4.* Refer to the latest issue of DA Pam 310-4 to determine whether there are new editions, changes, or additional publications pertaining to this equipment.

b. **DA Pam 310-7.** Refer to DA Pam 310-7 to determine whether there are modification work orders (MWO'S) pertaining to the equipment.

1-3. Block Diagram

(fig. 1-1)

The functional operation of Generator, Signal Sweep SG-593/U, based on the block diagram,

is described in a through g below. For complete circuit details, refer to the schematic diagrams (fig. 4-20 through 4-25).

a. Sweep Oscillator. The ultrahigh frequency (uhf) sweep oscillator, a tunable oscillator which operates from 275 to 1,200 Megahertz (MHz), forms the heart of the sweep generator. The frequency of its output is modulated by a variable, air-dielectric capacitor mounted on a voice coil mechanism. This modulating device, called a wobulator, is driven by an alternating current (at) voltage derived from the power transformer (b below). The sweep oscillator yields three output signals:

(1) One output is applied to the BAND SELECTOR switch. In the UHF position, this switch feeds the oscillator signal through the 0-to 50-decibel (db) variable attenuator to the RF OUTPUT jack. If the BAND SELECTOR switch is in the VHF position, the same sweep oscillator signal is applied to the very high frequency (VHF) mixer circuit where it beats with the 600-MHz signal generated by the fixed oscillator. The resulting signal is filtered to remove the sum frequencies and then fed to the RF OUTPUT jack through the variable attenuator. The filtered signal also drives the VHF-ALC (automatic level control) detector.

(2) A second output from the sweep oscillator is applied to the UHF-ALC detector. The signal from this detector (or from the VHF-ALC detector, depending upon the band selected) operates the VOLTS meter, and is fed to the automatic level control (ALC) amplifier where it is used to maintain the sweep oscillator signal at a constant level (c below).

(3) A third output from the sweep oscillator is applied to the harmonic marker generator. Here the sweep signal mixes with the 1-, 10-, and 100-MHz signals and their harmonics to generate three groups of marker signals (g below).

b. Wobulator Assembly. The wobulator assembly is physically connected to capacitor C601,