

TECHNICAL MANUAL

**OPERATOR, ORGANIZATIONAL, DIRECT SUPPORT,
GENERAL SUPPORT FIELD AND DEPOT
MAINTENANCE
MANUAL**

**SIGNAL GENERATORS
AN/URM-64 AND (NSN 6625-00-283-9621)
AND AN/URM-64A
(NSN 6625-00-553-0433)**

This reprint includes all changes in
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WARNING

THIS EQUIPMENT EMPLOYS HIGH VOLTAGES WHICH ARE DANGEROUS AND MAY BE FATAL IF CONTACTED BY OPERATING PERSONNEL. EXTREME CAUTION SHOULD BE EXERCISED WHEN WORKING ON THE EQUIPMENT.



Figure 1-1. Signal Generator AN/URM-64

SECTION I

GENERAL DESCRIPTION

1. PURPOSE OF HANDBOOK.

The purpose of this handbook is to provide complete instructions for the operation maintenance, and repair of Signal Generator AN/URM44 and Signal Generator AN/URM-64A. The information contained in this handbook is applicable to all equipments manufactured under various contracts, as listed its section VI. Where essential differences exist between equipments, reference is made to the contract number and (if applicable) to the equipment serial numbers involved.

Note

Throughout this handbook, all references to Signal Generator TS-419/U also apply to Signal Generator TS419A/U, except where specifically noted.

2. PURPOSE OF EQUIPMENT.

Signal Generator TS-419/U is a portable, self-contained, directly calibrated generator of continuous-wave or pulse-modulated radio-frequency signals. It is used for providing an accurate signal source in testing the operation of radio and radar equipment operating in the band of frequencies from 900 to 2100 megacycles per second, and for receiver measurements and other applications that require less than one milliwatt of cw or pulsed type r-f signals in this band of frequencies.

3. GENERAL PRINCIPLES OF OPERATION.

Signal Generator TS419/U consists of four major circuits: an r-f oscillator, modulator and synchronizer, output system, and power supply. The r-f oscillator is keyed by the modulator and synchronizer to produce the desired type of output signal. The modulator may be operated independent of external synchronizing signals or may be synchronized either with positive or negative pulses, or with sine waves from an external source. An external source of positive or negative modulation can be applied to the modulator. The output system is used to establish and indicate the amount of r-f power output from the equipment. The power supply provides plate and filament power for the modulator and oscillator.

4. EQUIPMENT SUPPLIED.

See table 1-1 (figures 1-1 and 1-3) for equipment supplied with Signal Generator TS-419/U. See table 1-4 (figures 1-2 and 1-4) for equipment supplied with Signal Generator TS-419A/U.

5. EQUIPMENT REQUIRED BUT NOT SUPPLIED.

No equipment other than that listed in table 1-1 is required for operation of Signal Generator TS-419/U.

Table 1-1. AN/URM-64 EQUIPMENT SUPPLIED

Quantity Per Equipment	Name of Unit	Army-Navy Type Designation	Overall Dimensions (Inches)			Weight (Pounds)	Numerical Series of Reference Symbols
			Length or Depth	Width or Diameter	Height		
Major Unit							
1	Signal Generator	TS-419/U	14	17-3/8	10-7/8	43	101-299
Accessories							
1	Transit case	CY-686/U	13-1/2	21-1/16	16-1/2	18.0	A-108
*1	Transit case	CY-686A/U	13-1/2	21-1/16	16-1/2	26.5	A-108
1	Power cable	CX-337/U	72	1-1/2	—	0.75	W-101
1	R-f cable	CG-546/U	72	27/64	—	0.25	W-102
†2	Video cable	CG-409/U	72	27/64	—	0.25	W-103—W-104
3	Adapter	UG-255/U	1-5/8	3/4	—	0.06	E-166—E-168
3	Adapter	UG-201/U	1-9/16	3/4	—	0.06	E-169—E-171
3	Adapter	UG-273/U	1-5/8	3/4	—	0.06	E-172—E-174
3	Lamp		1-3/32	3/8	—	0.02	I-103—I-105
‡3	Fuse		1-1/4	1/4	—	0.02	F-105—F-107
§5	Fuse		1-1/4	1/4	—	0.02	F-105—F-109
1	Bead thermistor		1-1/8	5/32	—	0.02	TH-104

* Transit Case CY-686/U and Transit Case CY-686A/U are alternates.

† For Contracts NOa(s)-12279, N383s-75748, and N383s-77651. Length of cable is 96 inches, weight 0.35 pound.

‡ For Contracts N383s-5019A, NOa(s)-9748, N383s-45741, and N383s-67816. Quantity does not include spare fuses located on front panel.

§ For Contracts N383s-60879 and N383s-61060. Quantity does not include spare fuses located on front panel.

6. GENERAL ELECTRICAL CHARACTERISTICS.

u. **POWER REQUIREMENTS.**—Signal Generator TS-419/U is designed to operate from an external voltage source of 115 volts, ± 10 per cent, a-c, 50 to 1600 cycles per second, single phase, without the need for voltage or frequency range switching. The required volt-amperes do not exceed 300 when the generator is operated within the limits of the line voltage and frequencies given above.

b. **OPERATING RANGE.**—Signal Generator TS-419/U operates throughout a band of frequencies of 900 to 2100 megacycles per second, producing cw or pulse-modulated rf at a maximum power output level of one milliwatt. An internal pulse generator permits modulation by pulses of repetition rate between 40 and 4000 pulses per second, with delay of 3 to 300 microseconds and width of $\frac{1}{2}$ to 10 microseconds. Provision is made for synchronization with an external pulse or sine wave generator. Modulation by an external pulse generator is also possible.

c. **DETAILED CHARACTERISTICS.**—A detailed list of electrical characteristics is given in paragraph 2. of section V.

d. **STANDBY HEATERS.**—Standby heaters are provided. The heaters, which are located on the underside of the chassis, maintain the instrument at approximately six Centigrade degrees (eleven Fahrenheit degrees) above ambient temperature.

7. DESCRIPTION OF EQUIPMENT SUPPLIED.

a. **SIGNAL GENERATOR TS-419/U.**—Signal Generator TS-419/U (figure 1-2) consists of four major circuits: an r-f oscillator, a modulator and synchronizer, an output system, and a power supply. All of these circuits and their related components are mounted on a common chassis, which is enclosed in a louvered instrument case. All electrical connections are made through the front panel. All controls are directly calibrated and are mounted on the front panel. Two vertically positioned handles, which act as guard rails, are located at the extreme ends of the front panel. The panel is finished a flat grey color and the instrument case is a wrinkle grey. Small vent holes are located in the bottom of the instrument case to permit drainage of any accumulated moisture. A white indicator lamp on the front panel indicates that the space heaters within the instrument are energized and that electronic circuits are unenergized. A red indicator lamp indicates that the electronic circuits are energized and the space heaters are off. Four fuses, two of which are spares, are installed in suitable fuse holders located near the lower left hand corner of the front panel. The weight of Signal Generator TS-419/U, including the instrument case, but not including the transit case and accessories, is 43 pounds. Outline dimensions of Signal Generator TS-419/U removed from the instrument case are shown

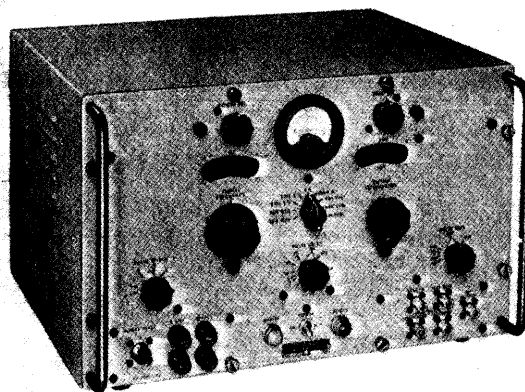


Figure 1-2. Signal Generator TS-419A/U,
Right Oblique View

in figure 7-8. Overall dimensions, including the instrument case, are listed in table 1-1 for Signal Generator TS-419/U, and in table 1-4 for Signal Generator TS-419A/U.

b. **ACCESSORIES.** (See figures 1-3 and 1-4.)

(1) **TRANSIT CASE.**—Transit Case CY-686/U, CY-686A/U, or CY-686C/U is supplied for transporting the signal generator and protecting it when not in use. All accessories, except the power cable (which is located within the transit case with the TS-419/U), are contained in an aluminum case fastened to the underside of the cover of the transit case. The CY-686/U and CY-686A/U differ with regard to their overall dimensions, total weight (refer to table 1-1), the number of cover latches, and the type of carrying handles. In the CY-686/U, the carrying handles are attached to the external surface at each end. In the CY-686A/U, though located in the same relative position, recessed spring return handles are used. In the CY-686C/U, the spring return handles are flush-mounted. All transit cases are constructed of balsa panels, covered on both sides with aluminum sheet and finished in gray enamel. The cover, which is detachable, is equipped with a molded rubber gasket, which presses against the top edges of the transit case when the cover is in position, thus providing a watertight seal. The cover is secured to the body of the CY-686/U by ten trunk-type fasteners. In the CY-686A/U and CY-686C/U, only six fasteners are used.

(2) **ADAPTERS.**—Three each of adapters UG-201/U, UG-255/U, and UG-273/U are supplied. These adapters provide a means for electrical and mechanical mating of various other common types of radio-frequency connectors with each other. Adapter UG-201/U provides a means for mating a female type "N" connector, such as UG-22B/U, with a male type BNC connector,