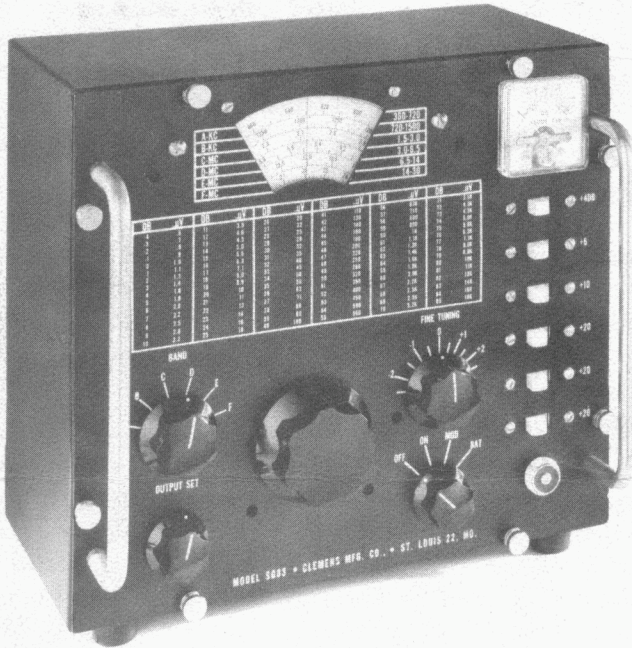


# STANDARD SIGNAL GENERATOR MODEL SG-83



The Model SG-83 Standard Signal Generator is a laboratory test instrument which generates accurately known r-f voltages in the 360 kc to 30 mc range. Either unmodulated or modulated signals may be obtained. This instrument makes possible for the first time at moderate cost accurate laboratory measurements which are essential in communication circuit development and testing.

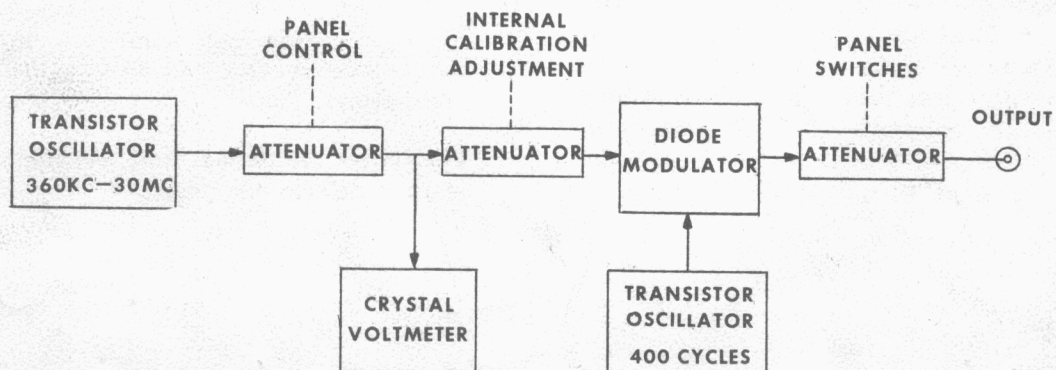
Because of its accurate output voltage calibration, the SG-83 can be used to make quantitative r-f signal measurements. This signal generator should not be confused with the common signal generator which provides only a source of signals of unspecified level or modulation characteristics. With the SG-83, laboratory measurements may be made which previously required much more expensive industrial equipment not usually available to individuals.

The SG-83 signal generator will produce signals of 0.6 microvolt to 16,000 microvolts, accurate to approximately 1 db or  $\pm 10\%$ . The output signal is calibrated directly in decibels with zero db equal to one microvolt across a 50 ohm load. Other levels up to + 84 db (16,000 microvolts) are obtainable with the switch attenuator and meter. On the front panel of the instrument is a chart to facilitate rapid conversion from microvolts to db and vice versa.

The r-f signal is generated by a high-frequency transistor oscillator. The power level of the oscillator is maintained at a level just sufficient to be metered on a panel microammeter to reduce the strength of leakage fields. The transistor r-f oscillator gives excellent frequency stability since there is none of the long warm-up drift common in vacuum tube oscillators. The output is extremely flat over the frequency ranges. Variation in oscillator output over any one band is normally less than 1 db. It is not necessary to readjust the output attenuator continually as the generator is tuned over a wide frequency range, which is a definite convenience in operation.

Output from the transistor oscillator is applied to a constant input impedance variable attenuator which is adjusted by a front panel control. The attenuator is designed to produce very little change in loading on the oscillator as the attenuation is varied, to minimize effects on the frequency of the oscillator.

The oscillator has a fine tuning control which is useful in varying the frequency in small increments or recalibrating the main tuning dial against an external frequency standard. The fine tuning control is calibrated from + 2.5 to - 2.5 Kc when the main tuning dial is set to 455 Kc. This permits small frequency changes to be read directly when making response curve tests at the commonly used i-f frequency.



BLOCK DIAGRAM

Modulation of the output signal is achieved by a method which insures pure sinusoidal amplitude modulation free of incidental frequency modulation. The modulation is maintained constant at 30% regardless of the r-f output level or frequency. Output from the r-f oscillator is attenuated to provide the isolation which prevents frequency modulation. The attenuated r-f output current is then passed through a silicon diode which is biased in the forward direction by a small current from the power supply battery. A built-in 400-cycle transistor oscillator generates the modulating sinusoidal waveform. The audio oscillator output voltage is superimposed on the diode dc bias, varying the conductivity of the diode and thereby modulating the r-f output signal. The percent modulation is set between zero and 40% by a screwdriver adjustment accessible without removing the instrument from its cabinet. Modulation is adjusted to 30% when the instrument is calibrated at the factory.

A 2:1 frequency range is covered on each band and the average dial scale length is 12 inches on each band. This results in a tuning dial of unusually high resolution, readability and reset accuracy. The dial is permanently printed on metal and employs an all metal, positive, rim drive vernier mechanism. The smooth dial drive and hairline dial index result in

frequency calibration accurate to better than 1% throughout the frequency range.

The SG-83 is a fully portable standard signal generator operating from its own self-contained battery. The condition of the battery can be checked by the panel meter by placing the power switch in the "BAT" position. The battery is inexpensive and easily replaced and will operate the generator for approximately 400 hours or one year in normal use.

Since it is a battery powered instrument the SG-83 does not inject line conducted noise in sensitive equipment under test. It is often necessary to make tests in a screen room when using a line operated signal generator because of this noise. Since there is no power line connection required for the SG-83, tests can usually be made without a screen room, free of line noise disturbance.

An output cable with binding posts and a terminating resistor is furnished with each instrument. A switch is provided to remove the terminating resistor whenever the equipment under test provides a terminating load for the cable. A handbook of operating instructions, schematic diagram, etc., is furnished with each instrument. A description is included of the techniques for measuring receiver signal-plus-noise to noise, image rejection, etc.

## SPECIFICATIONS

### Frequency Ranges:

Band A:	360-720 KC
Band B:	720-1500 KC
Band C:	1.5-3.0 MC
Band D:	3.0-6.5 MC
Band E:	6.5-14.0 MC
Band F:	14.0-30.0 MC

Output: 0.6 to 16,000 microvolts in 1 db steps. Output is factory adjusted with instruments of  $\pm 5\%$  accuracy to 1000 microvolts at 600 KC. The calibrated output meter and switch attenuators are accurate to within 2 db at any other settings throughout the frequency range of the instrument. Leakage fields are equivalent to less than 0.3 microvolt at the output terminals and may produce this amount of error at output settings of 1 microvolt or below, decreasing to zero error at 10 microvolts or above.

Modulation: Output may be modulated or unmodulated. Modulation is factory adjusted to  $30 \pm 5\%$ . Modulation percent is not affected by carrier frequency or output level. Modulation frequency is 400 + 20 cycles, sinusoidal, with audio distortion under 10%. There is no frequency modulation.

Calibration: Frequency is indicated to an accuracy of 1% or better.

Battery Life: Nominal 400 hours continuous operation or 1 year in average use. Battery condition checked by panel meter.

Size: 9" high x 9½" wide x 6⅝" deep.  
Shipping Weight: 13 lbs.

Accessories Supplied: Four-foot output cable with terminating resistor and switch, Instruction Manual, and battery.

Guarantee: Materials and workmanship guaranteed against defects one year.