

FIGURE i—MODEL 1801A SWEEP/SIGNAL GENERATOR

### SCOPE OF THIS MANUAL

This manual provides descriptive material and instructions for the installation, operation, maintenance, and repair of the WAVETEK Model 1801A Sweep/Signal Generator.

# SECTION I

## GENERAL INFORMATION

### 1.1 INTRODUCTION

The Wavetek Model 1801A Sweep/Signal Generator provides features and options ideally suited for the manufacturer, installers, and operators of CATV systems.

The frequency range of from 1 to 500 MHz, or, with the high band, of from 1 to 950 MHz, adequately covers the frequency bands now being used as well as those of the future. The instrument will sweep each band in its entirety, or sweep width may be continuously reduced to CW operation.

The Ultra Flat 75 ohm output system is calibrated from +57dBmV to -33 dBmV. 20dB of the total attenuation is a continuously variable electronic attenuator (P.I.N. diode). A three position reference switch, in parallel with this attenuator, will increase or decrease the output by  $\pm 0.5$ dB. (An internal calibration allows the reference to be set at any level from  $\pm 0$ dB to  $\pm 0.5$ dB). This greatly aids in flatness measurements by providing an accurate rapid calibration

reference.

Other features include Built-In RF Detector, External Leveling Circuitry, and a complete Crystal-Controlled Birdy Marker System which may be used to internally modulate the RF signal. A selection of marker widths for wide band or narrow band operation is also provided.

The instrument will sweep at Line frequency, 60 Hz, or as slow as 1 sweep in 100 seconds. A special sweep rate position facilitates faster testing of operating CATV systems with minimum subscriber interference. The sweep time of this position is adjustable from 1 to 10 milliseconds and the repetition rate is adjustable from 1 to 10 seconds.

The Model 1801A uses modular construction for ease of maintenance and modifications. All standard options can be either factory or field installed.

The small, compact, all solid-state instrument is 5-1/4" X 8" X 13" and weighs only 20 pounds.

### 1.2 SPECIFICATIONS

TABLE 1-1. SPECIFICATIONS

RF SPECIFICATIONS		
Frequency Range -	Band 1 1 to 500 MHz	Band 2 450 to 950 MHz
Operating Modes -	Sweep and CW	
Frequency Dial Calibration -	10 MHz intervals	
Accuracy -	10 MHz or 2% of selected frequency which ever is greater	
Vernier Frequency Control -	$\pm 5$ MHz	
Sweep Width -	200 kHz to 500 MHz	

TABLE 1-1. Specifications (Con't.)

Display Linearity -	2%
Spurious Signals -	At least 30dB below the output from 10 to 300 MHz At least 26dB below the output from 300 to 950 MHz
Residual FM -	Less than 15 kHz
Drift -	100 kHz/5 minutes-2MHz/8 hours (after 1/2hour warm-up at a constant ambient, and allowing a 5 minute stabilizing period after a frequency change)
Blanking -	Retrace blanking of the RF output provided for sweep operation. Removed for CW operation.
RF Output	
Impedance -	75 ohms
Max Level -	+57dBmV (.7Vrms)
Flatness -	+ .35dB at max level over both bands
Attenuation -	Continuously adjustable from +57dBmV to -33dBmV 70dB attenuator-in 10dB steps 20dB vernier - calibrated in 1dB steps
	ACCURACY OF 70dB STEP ATTENUATOR
	+ .5dB to 500 MHz <u>+1dB to 950 MHz</u>
	ACCURACY OF 20dB VERNIER ATTENUATOR
	+ .5dB to 500 MHz <u>+1dB to 950 MHz</u>
Reference	
Attenuator -	Provides a precise level change above and below the set output level. Internally adjustable from 0 to .5dB
REMOTE PROGRAMMING	
A Rear Panel REMOTE Jack provides necessary connections for Remote Control of Frequency, Sweep Width and the 0 to 20dB Vernier output control. This jack also provides connections for EXTERNAL Amplitude and Frequency Modulation.	
Frequency -	May be remotely programmed by a <u>+16</u> volt signal (-16 volts corresponds to LOW frequency band end and +16 volts to HIGH frequency band end).
Sweep Width -	May be controlled by a remote potentiometer. (Input and output connections provided in Rear Panel REMOTE Jack.)
Vernier 0-20dB Output -	May be remotely programmed over a 20dB range with a 0 to -14 volt signal (-14 volts corresponds to maximum output).

TABLE 1-1. Specifications (Con't.)

External FM -	The full frequency range can be swept at rates up to 4 kHz. With reduced Deviation and Linearity, modulation rates to 100 kHz are possible.
External AM -	External AM signals are applied to the same connections as for vernier 0-20dB control. Therefore, vernier range must be restricted so the 0 to -14 volt range is not exceeded or distortion will occur. With average voltage set to mid-range, 100% modulation is obtainable up to 1 kHz, 40% modulation is obtainable up to a 40 kHz rate.
<b>SWEEP SPECIFICATIONS</b>	
Sweep Modes -	Repetitive sweep Single sweep Externally triggered sweep Manual sweep Line-lock sweep
Sweep Time -	Continuously variable from 10 to 100MSEC and from 1 second to 100 seconds plus a special range used for sweep testing of operating CATV systems. The sweep time of this range is variable from 1 to 10MSEC and the repetition rate is variable from 1 to 10 seconds.
Horizontal Output -	16 volts peak-to-peak (symmetrical about ground)
<b>EXTERNAL LEVELING</b>	
External Monitor (ALC) -	An external negative signal, between 0.2 and 2 volts, may be used to level the RF output. The ALC Front Panel input jack mates with Switchcraft type 750 plug.
<b>MARKER SPECIFICATIONS</b>	
Type -	Birdy by-pass markers with provisions for 6 plug-in marker modules, plus, Rear Panel external marker input. Markers may be either single frequency or harmonic (comb.) type. (See Options A-1 and A-2)
Accuracy -	0.005%
External Marker Input -	Rear Panel BNC connector accepts external CW signal for conversion to a Birdy marker. Input Level: 100mV into 50 ohms.
Marker Width -	Adjustable from (approx) 15 to 400 kHz in four steps.
Marker Size -	Adjustable from (approx) 1V to 1mV peak-to-peak.

# GENERAL INFORMATION

TABLE 1-1. Specifications (Con't.)

**Rectified Birdy -** Internal switch removes the negative portion of the birdy marker for use with X-Y recorders. Size varies with detector's impedance. Adjustable from (approx) 6 volts to 1mV with detector impedance of 1 meg ohm, or from 0.5V to 1mV with detector impedance of 0 ohms.

**Marker Modulation -** Markers may be used to modulate the RF output signal or added at the scope Vertical input.

**POWER REQUIREMENTS**

Line Supply 115 or 230 VAC  $\pm 10\%$ , 50 to 60 Hz, (approx. 20 watts)

**MECHANICAL SPECIFICATIONS (See Figure 1-1.)**

**A** For total length, including knobs, add 11/16 inch

**B** For total height, including feet, add 5/8 inch

**C** For total width, including screw heads, add 3/16 inch

**Weight**

Net - 20 lbs.

Shipping - 25 lbs.

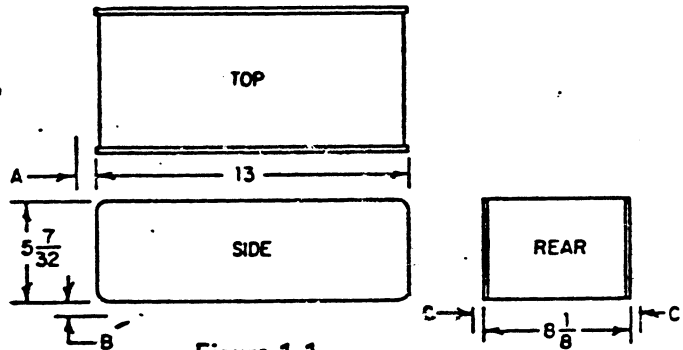


Figure 1-1.

**1.3 OPTIONS**

- A1 Marker Any single frequency between 1 to 950 MHz.
- A2 Marker Harmonic type at 1, 10 or 50 MHz. (Other frequencies available on special order.)
- A4 Modulator Provides 100% amplitude modulation at a 1 kHz rate.
- A5 Pen-lift Provides contact closure during sweep time.

**1.4 ACCESSORIES**

- 1.4.1 Accessories furnished: Instruction manual and Plug to mate with Rear Panel REMOTE jack.
- 1.4.2 Accessories available:

Wide Band RF Detector

Model D171 for 75 ohm applications up to 1000 MHz.

Service Kits

K102. Contains a module extender and extension cable.

19 Inch Rack Mounting Kits

K103. Mounts single instruments in a 5-1/4 inch space. (See Figure 2-1.)

K104. Mounts one or two instruments in a 7 inch space. (See Figure 2-2.)