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SECTION

GENERAL INFORMATION

1.1 INTRODUCTION

The compact WAVETEK MODEL 2001 Sweep/Signal Generator offers programming, versatility and an exceptionally wide frequency range (1 to 1400 MHz) in a ruggedized inexpensive instrument. Its unique adaptability promotes sophisticated laboratory applications, as well as automatic production testing.

Each of its three frequency ranges (1-500 MHz, 450-950 MHz, and 900-1400 MHz) may be used in 3 modes of operation; start-stop, Δf or CW. It can be swept from end-to-end, up-or-down, at any rate from 50 sweeps per second to 1 sweep every 100 seconds. Manual, triggered, or recurring sweeps are provided and the sweep frequency, sweep width, and output attenuation all may be controlled by external voltages.

Up to six crystal controlled birdy marker modules (single frequency or harmonic type) may be plugged into the 2001. Each module has its own Front Panel On/Off switch. Front Panel amplitude and width controls enable optimum adjustment of the marker display. In application, the

markers may be tilted 90° for easy viewing when displayed with steep transition signals or rectified for X-Y plotter applications by a Front Panel switch. A 1kHz square wave modulator, providing 100% amplitude modulation of the RF output for low level recovery applications, is available as an optional feature.

Most optional features, as well as the functional circuits for the basic sweep generator, have modular plug-in construction. This allows optional features to be factory installed at the time of purchase, or customer installed at a later date. This concept offers protection against obsolescence since updated and additional features can be simply and economically added as new test procedures dictate.

Maintenance problems can be greatly simplified by stocking several modules instead of hundreds of discrete components. Servicing time of a defective instrument can be cut to a fraction of the time previously required and can be performed by relatively inexperienced technicians. Modules for the 2001 are stocked in Wavetek service centers around the world.

1.2 SPECIFICATIONS

Table 1-1. lists the specifications for MODEL 2001 Sweep/Signal Generator.

TABLE 1-1.
SPECIFICATIONS

RF SPECIFICATIONS	
Frequency Range —	1 to 1400 MHz in three overlapping bands. Band 1 1 to 500 MHz Band 2 450 to 950 MHz Band 3 900 to 1400 MHz
Operating Modes —	Start/Stop, Δf , and CW

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

Frequency Dial Calibration —	10 MHz intervals	
Accuracy —	Band 1	10 MHz
	Band 2	2% of selected frequency
	Band 3	2% of selected frequency
Sweep Width —	200 kHz to 500 MHz-calibrated in 10 MHz intervals	
Accuracy —	Band 1	±10 MHz
	Band 2	±20 MHz
	Band 3	±20 MHz
Display Linearity —	2%	
Spurious Signals —	Band 1	10 to 500 MHz 26dB below output
	Band 2	500 to 950 MHz, 26dB below output
	Band 3	900 to 1400 MHz, 26dB below output
Residual FM —	Less than 15kHz	
Drift —	100 kHz/5 minutes — 2 MHz/8 hours (after 1/2 hour 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 Amplitude —	Continuously adjustable from +10 to -80 dBm; 70 dB in 10 dB steps, plus a 20 dB vernier, calibrated in 1 dB increments. Step attenuator and vernier attenuator accuracy: ±0.5 dB to 500 MHz ±1 dB to 1000 MHz ±2 dB to 1400 MHz	
Flatness at +10 dBm —	±0.5 dB over 1 to 1400 MHz (when read with negative detector) ±0.75 dB over 1 to 1400 MHz (when read with a power meter)	
Impedance —	50 ohms	

REMOTE PROGRAMMING

A Rear Panel REMOTE Jack provides necessary connections for Remote Control of frequency, sweep width and the 0 to 20 dB vernier output control. This jack also provides connections for EXTERNAL amplitude and frequency modulation.

Frequency — May be remotely programmed within the selected band by a ±16 V signal. (-16 volts corresponds to LOW frequency)

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

	band end and +16 volts to HIGH frequency band end) Tuning sensitivity: 16 MHz/volt (approx.)
Sweep Width —	May be controlled by a remote potentiometer. (Input and output connections provided in Rear Panel REMOTE jack)
Vernier 0-20 dB Output —	May be remotely programmed over a 20 dB range with a 0 to -18 volt signal. (-18 volts corresponds to a maximum output)
External FM —	Full deviation of ± 250 MHz possible at rates up to 4kHz. With reduced deviation and linearity, modulation rates to 100kHz are possible. Sensitivity: 16 MHz/volt (approx.)
External AM —	External AM signals are applied to same connections as for vernier 0-20 dB control. Therefore, vernier range must be restricted so the 0 to -18 volt range is not exceeded or distortion will occur. With average voltage set to mid-range, 100% modulation is possible to 1kHz, 40% modulation possible to a 40kHz rate.
<u>SWEEP SPECIFICATIONS</u>	
Sweep Modes —	Repetative sweep Single sweep Externally triggered sweep Manual sweep Line lock sweep
Sweep time —	Continuously variable from less than 10 ms to over 100 seconds, in 4-decade steps, plus vernier
Horizontal Output —	16 volts peak-to-peak (symmetrical about ground)
<u>EXTERNAL LEVELING</u>	
External Monitor (ALC) —	An external negative signal, between 0.2 and 2 volts, may be used to level the RF output
<u>MARKER SPECIFICATIONS</u>	
Type —	Birdy by-pass markers with provisions for six plug-in marker modules, plus Front Panel external marker input. Markers may be either single frequency or harmonic (comb.) type. (See Options A1 and A2)
Accuracy —	0.005% N.B. BANDS 2 & 3 LACK A BUFFER STAGE IN OUTPUT AMPLIFIER, HENCE, S_{OUT} FOR $V_{PARAM} = \text{CONST.}$ DEPENDS ON LOAD IMPEDANCE.

TO OBTAIN RATED ACCURACY, DO NOT CHANGE THE ATTENUATOR SETTING (COARSE & FINE) DURING A MEASUREMENT.
(ONLY THE 0.6 POSITION OF THE STEP ATTENUATOR IS DIFFERENT. -10 & -20 ARE EQUIVALENT.)

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

External Marker Input —	Front Panel BNC connector accepts external CW signal for conversion to a Birdy marker. Input level: 100 mV into 50 ohms
Marker Width —	Adjustable from (approx.) 15 to 400 kHz in four steps
Marker Size	
Large —	Adjustable from (approx.) 12 V to 15 mV peak-to-peak
Small —	Adjustable from (approx.) 50 mV to 100 μ V peak-to-peak
Rectified Birdy (for use with X-Y plotters) —	Size varies with detector's impedance. Adjustable from (approx.) 6 V to 1 mV with detector impedance of 1 meg ohm, or from 0.5V to 1 mV with detector impedance of 0 ohms. Rectified birdy is positive polarity
Marker Tilt —	Provides horizontal markers have a size equal to approximately 10% of horizontal display. Adjustment of marker size vectorily adds the normal vertical marker to the horizontal marker, causing the resulting marker to vary from a horizontal position toward a vertical position,

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 — 19 lbs.
Shipping — 25 lbs.

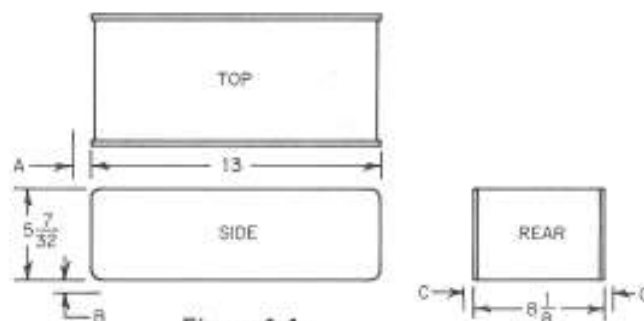


Figure 1-1.

1.3 OPTIONS

- 1.3.1 Marker A-1. Any single frequency between 1 to 1400 MHz.
- 1.3.2 Marker A-2. Harmonic type at 1, 10 or 50 MHz. (Other frequencies available on special order.)
- 1.3.3 Modulator A-4. Provides 100% amplitude modulation at a 1 kHz rate.
- 1.3.4 Penlift A-5. Provides contact closure during sweep time.

1.4 ACCESSORIES

1.4.1 Accessories furnished: Instruction manual and plug to mate with Rear Panel REMOTE jacks.

1.4.2 Accessories Available:

- a. Wide-band RF Detector — Model D-152.
- b. Service Kit — K102. Contains a module extender and extension cables.
- c. Rack Mount Kit — K103. Mounts single instruments in a 5-1/4 inch space. See Figure 2-1.
- d. Rack Mount Kit — K104. Mounts one or two instruments in a 7 inch space. See Figure 2-2.