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TECHNOLOGY GROUP

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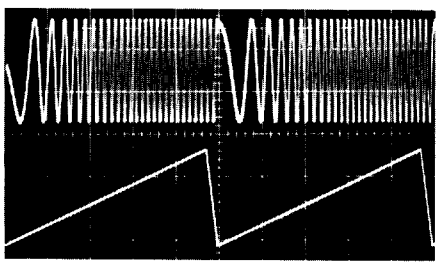
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5 MHz Sweep Generators



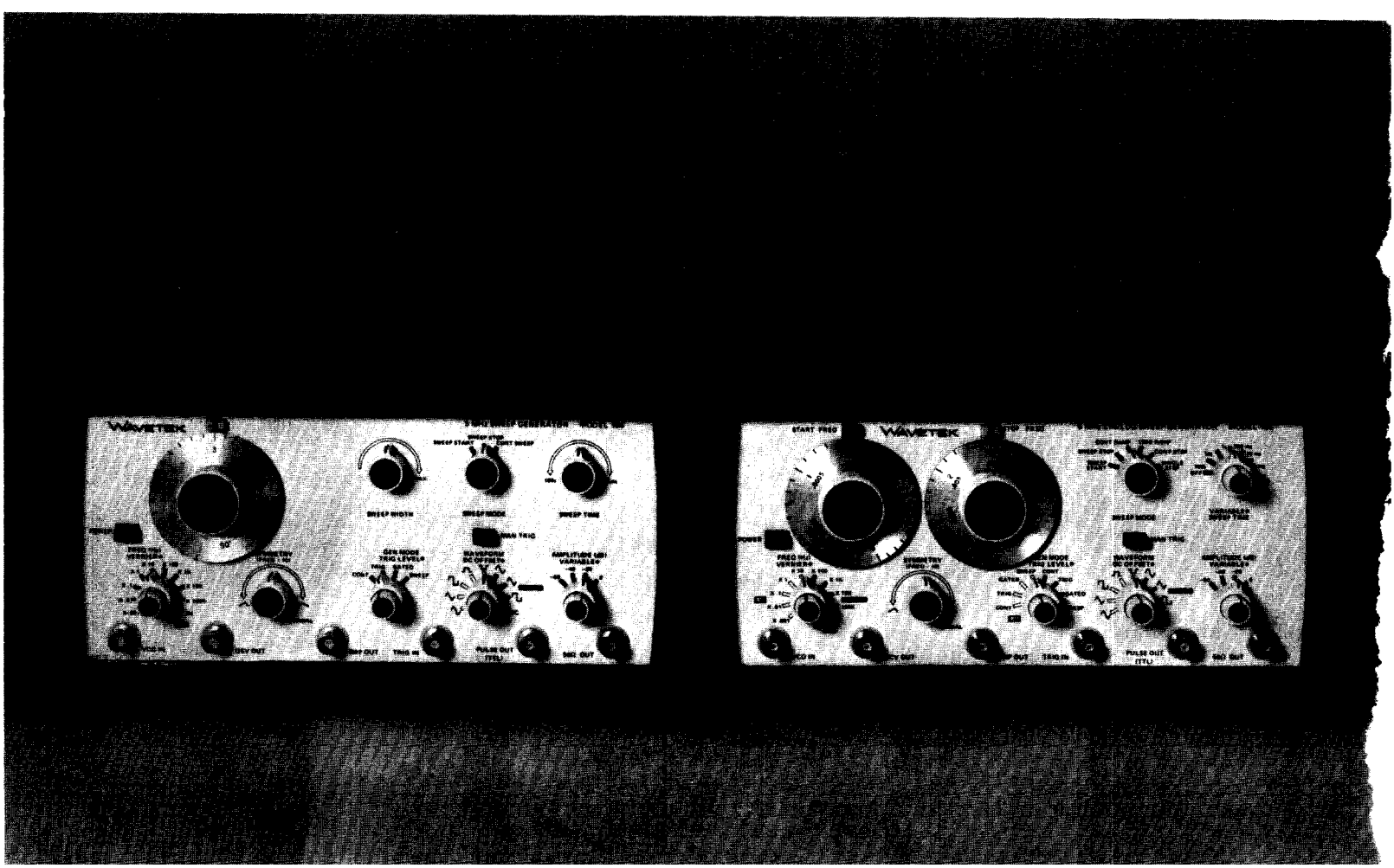
- **0.0001 Hz to 5 MHz Frequency Range**
- **Linear or Logarithmic Sweep**
- **Triggered and Gated Output**
- **20 Volt Peak-to-Peak Output with 80 dB Attenuation Control**

Sweep Features
Models 184 and 185 operate over the broad 0.0001 Hz to 5 MHz frequency range with linear rate sweeps to 1000:1 in 10 ranges. Model 185 has, in addition, logarithmic sweep of 100,000:1 in its upper five ranges. Sweep and end points are easily set by front panel controls. Model 185 end points are set by calibrated dials and sweep may be high-to-low frequencies as well as the conventional low-to-high. Model 185 offers step sweep. Selected sweep range is automatically divided into ten equal frequency steps, which are sequenced automatically or by pushbutton.

Waveforms and Modes
Both models offer sine, triangle, square, positive pulse and negative pulse waveforms with controllable dc offset and continuous waveform symmetry control.

Besides sweep modes, continuous output, triggered single cycles and gated bursts of cycles are available. Triggering can be by front panel pushbutton or external signal.

20 Vp-p Amplitude
Output amplitude is 20 volts peak-to-peak (50Ω source into open circuit) or 10 volts peak-to-peak into 50Ω. You can attenuate the output to 80 dB for signal levels down to 1 mV.



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VERSATILITY

Waveforms
Sine ∿, square ⊓, triangle △, positive pulse ⎍, negative pulse ⎎, ramp ◿, and dc.

Operating Modes
Continuous output.
Triggered waveform cycle.
Gated bursts of cycles.
Sweep of recurring low-to-high or (Model 185 only) high-to-low frequency. Range and rate selectable.

Frequency Range
0.0001 Hz to 5 MHz in 10 overlapping linear ranges.
(Model 185 only) 0.005 Hz to 5 MHz in 5 overlapping logarithmic ranges.
Dial and vernier gives 3 decades of frequency per linear range and (Model 185 only) 5 decades per logarithmic range.

Main Output
∿, ⊓, △ selectable and variable to 20 Vp-p max (10 Vp-p into 50Ω). ⎍, ⎎ selectable and variable to +10V max (±5V into 50Ω). Voltage attenuation 0 to 80 dB: to 60 dB in 20 dB steps plus 20 dB vernier. Output impedance 50Ω.

DC Offset and DC Output
Waveform offset and dc output selectable through 50Ω output. Adjustable between ±10V max (±5V into 50Ω load) as offset or Vdc output. Signal peak plus dc offset limited to ±10V (±5V into 50Ω). DC offset and output are attenuated proportionately by the attenuator.

TTL Pulse Output
TTL pulse at generator frequency; rise and fall time typically 15 ns. Symmetry variable. Drives up to 20 TTL loads.

Model 184 Sweep
Linear (3 decades max) and sweep up.
Sweep Time: 100s to 1 ms; continuously adjustable.
Sweep Width: Up to 1000:1 adjustable on all ranges.
Sweep start and stop: Adjustable throughout each of 10 ranges.

Model 185 Sweep
Linear (3 decades max) or logarithmic (5 decades max); sweep up or down; continuous, in series of 10 steps, or triggered for one sweep or one step.
Sweep Start and Stop: Set by calibrated independent controls.
Sweep Time: 100 μs to 100s.

Sweep Output
◿ or (Model 185 only) ◿; +7.5 peak (open circuit) 600Ω source.

GCV—Generator Control Voltage
0 to +5V open circuit output proportional to frequency of main generator; 1 kΩ impedance. For use as a horizontal drive signal.

VCG—Voltage Controlled Generator
Up to 1000:1 (linear) 100,000:1 (log, Model 185 only) frequency change with external 0 to ±5V signal. Upper frequency is limited to maximum of selected range.
Input Impedance: 5 kΩ (Model 184) 10 kΩ (Model 185).
Linear Slew Rate: 2% of range per μs.
Linearity: 0.5% for 0.0001 Hz to 50 kHz.
Logarithmic Slew Rate (Model 185 only): 0 to 80% of range in 40 μs; 80 to 100% of range in 200 μs.
Logarithmic Response (Model 185 only): Approximately 1 decade per volt.

Symmetry Control
Symmetry of waveform is continuously adjustable from 1:19 to 19:1 for variable duty cycle pulses and sawtooth ramps.

NOTE: When SYMMETRY control is used, indicated frequency is divided by approximately 10.

Trigger and Gate
Input Range: 1 Vp-p ±10V.
Impedance: 10 kΩ, 33 pF.
Pulse Width: 50 μs min.
Repetition Rate: 5 MHz max.

FREQUENCY PRECISION

Dial Accuracy
±2% of full scale for 0.005 Hz to 5 MHz.
±4% of reading and ±2% of full scale for 0.0005 to 0.005 Hz.

Time Symmetry
±1% for 0.005 Hz to 500 kHz.

AMPLITUDE PRECISION

Amplitude Change With Frequency
Sine variation less than:
±0.1 dB of 0 to 100 kHz.
±0.2 dB for 100 kHz to 1 MHz.
±1.0 dB for 1 to 5 MHz.

Amplitude Symmetry
1% of amplitude range for 0 to 1 MHz.

Step Attenuator Accuracy
±0.3 dB per 20 dB step.

WAVEFORM CHARACTERISTICS

Sine Distortion
Less than:
0.5% for 10 Hz to 50 kHz.
1.0% for 0.005 Hz to 500 kHz.
All harmonics at least 30 dB down for ×1 MHz range.

Triangle Linearity
Greater than 99% for 0.0005 Hz to 100 kHz.

Square Wave Rise and Fall Time
Less than 30 ns terminated into 50Ω load.

GENERAL

Stability
Amplitude, dc offset and frequency in linear mode.
Short term: ±0.05% for 10 min.
Long term: ±0.25% for 24 hours.

Environmental
Specifications apply at 25°C ±5°C. Instrument will operate from 0°C to +50°C.

Dimensions
28.6 cm (11¼ in.) wide; 13.3 cm (5¼ in.) high; 27.3 cm (10¾ in.) deep.

Weight
3.9 kg (8.5 lb) net; 5.5 kg (12 lb) shipping.

Power
90 to 110V, 105 to 125V, 180 to 220V or 210 to 250V; 50 to 400 Hz; less than 25 watts.

NOTE: Specifications apply from 10 to 100% of a selected frequency range with SYMMETRY control to NORMAL. Symmetry and vernier affect frequency calibration. Maximum possible asymmetry is dependent upon frequency setting.

PRICE (FOB San Diego)

Model 184	**$695**
Model 185	**$845**

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