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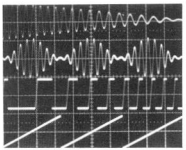
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50 MHz Pulse/Function Generator



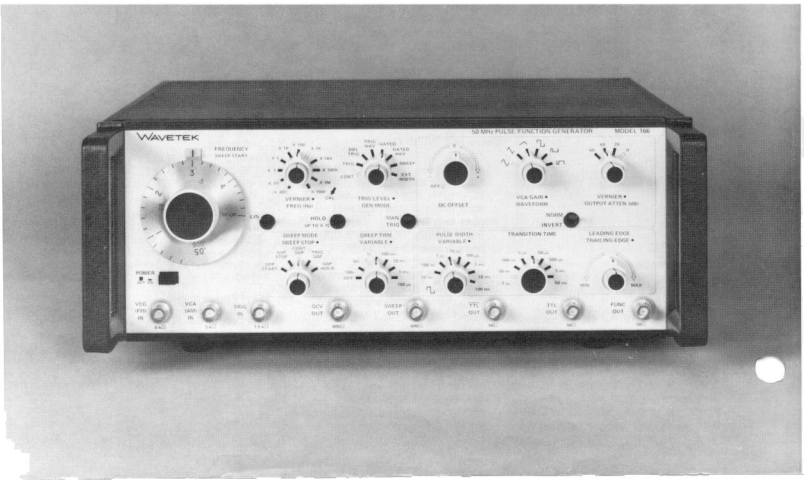
- 0.0001 Hz to 50 MHz Range
- 30 Volt Peak-To-Peak Output
- Lin/Log Sweep Plus AM and FM
- Pulse Width and Transition Time Control
- Independent Pulse Width and Rate

Pulse and Functions
The Model 166 Pulse/Function Generator fills your requirement for a truly versatile laboratory instrument. It is a swept sine, square and triangle function generator for your analog applications and a pulse generator with width and transition control for your digital testing requirements. And for all its versatility, the Model 166 controls, clustered for function, are readily understandable and direct-acting.

0.0001 Hz to 50 MHz Range
The frequency range of 0.0001 Hz to 50 MHz gives you the frequency and repetition rates in greater ranges than normally found in function or pulse generators alone. The sine, triangle, square, haverwave and ramp waveforms and the pulses can be output in a variety of mode of triggering and sweep.

You can tailor Model 166 pulses for your testing requirements. Pulses are fully shape controlled in amplitude, width and transition times. Simultaneously with the variable pulse output, TTL and TTL pulse outputs give you automatic logic-compatible pulses. An external width mode lets you reconstruct external pulses for logic conversion or noise removal.

AM and FM
To round out the versatility of the Model 166, the output pulse as well as the functions can be amplitude and frequency modulated with an AC signal or amplitude and frequency controlled with a remote DC signal. Amplitude modulation can be to 200% for suppressed carrier operation.



Instrument operates as a sweep/function generator or a pulse generator.

SWEEP/FUNCTION GENERATOR

Selectable Waveforms
Sine ∿, triangle △, square ⊓ and ramp ◿. All can be inverted. Ramp up-down ratio can be as large as 1:1000. All can be amplitude and frequency modulated.

Operational Modes
Continuous: Generator oscillates continuously at selected frequency.
Triggered: Generator quiescent until triggered by external signal or manually, then generates one cycle.
Double Triggered: As triggered, except two cycles are generated.
Triggered Haverwave: As triggered mode. Output is one cycle starting at −90° (or +90°).
Gated: As triggered, except output continues for duration of gate.
Gated Haverwave: As gated. Output is a burst of cycles starting at −90° (or +90°).
Continuous Sweep: Generator frequency continuously sweeps up from start to stop frequency.
Triggered Sweep: Generator oscillates at sweep start frequency until triggered, then generates one sweep to the stop frequency and returns to the start frequency.
Sweep and Hold: As triggered sweep mode, except the generator remains at stop frequency until the trigger signal falls, then returns to start frequency.

Frequency Range
0.0001 Hz to 50 MHz in 11 ranges. Maximum sweep 1000:1 in lin or log.

Sweep Time Range
100s to 100 μs in 6 ranges.

Function Output
Variable to 30 Vp-p (15 Vp-p into 50Ω). Voltage attenuation 0 to 80 dB: to 60 dB in 20 dB steps, plus 20 dB continuous vernier.

Low Frequency Hold
Function output will hold at the instantaneous voltage level when the hold switch is depressed. Effective in the 0.001 Hz to ×10 Hz ranges.
Amplitude Drift: Less than 0.2% of amplitude per minute.

DC Offset
DC offset of all waveforms is adjustable to ±10V (±5V into 50Ω). Waveform plus offset is limited to ±15V (±7.5V into 50Ω).

GCV Output
0 to +5V (nominal, open circuit) proportional to frequency of main generator.
Output Impedance: 600Ω

Sweep Output
0 to +5V (nominal, open circuit) ramp.
Output Impedance: 600Ω.
Sweep Time: 100s to 100μs.

VCG (FM)—Voltage Controlled Generator
Up to 1000:1 frequency change with external 0 to +5V signal.
Mode: Linear or logarithmic.
Slew Rate: 2% of range per μs.
VCG Linearity: 0.0005 Hz to 50 kHz ±0.5% of range.

Voltage Controlled Amplitude (VCA)
0 to ±5V gives 0 to 30V amplitude change. AC input allows 0 to 200% modulation (suppressed carrier).
AC input Range: 5V minimum for 100%, 10V minimum for 200% AM.
Input Impedance: 4.99 to 10 kΩ, depending on gain control.
Input Bandwidth: 10 kHz.

Trigger Input
Trigger Signal: 1 Vp-p minimum.
Trigger Level: ±5V.
Input Impedance: 1.5 kΩ, 30 pF.
Maximum Repetition Rate: 25 MHz.

FREQUENCY PRECISION

Dial Accuracy
(For ∿, △, ⊓ and linear dial setting of 0.5 to 5.)
±2% of full scale for 0.0005 Hz to 5 MHz.
+15%, −6% of full scale for 5 to 50 MHz.

AMPLITUDE PRECISION

Amplitude Change With Frequency
Sine and square variations less than:
±0.1 dB to 100 kHz;
±0.2 dB to 1 MHz;
±3 dB to 50 MHz.

Step Attenuator Accuracy
±0.3 dB to 20 dB step to 100 kHz.

WAVEFORM CHARACTERISTICS

Sine Distortion (Test at 10 Vp-p)
Less than:
0.5% for 10 Hz to 100 kHz.
All harmonics greater than:
30 dB down for 100 kHz to 5 MHz;
20 dB down for 5 to 50 MHz.

Triangle Linearity
Greater than:
99% for 0.005 Hz to 100 kHz.

Square Wave Aberrations (Test at 10 Vp-p)
Less than 5% of p-p voltage.

PULSE GENERATOR

Pulses
Variable amplitude positive or complementary pulses ⊓, ⊔. Pulse amplitude, width and rise/fall times are independently adjustable and independent of frequency. TTL and $\overline{\text{TTL}}$ pulses are simultaneous with main pulse. Pulses may be amplitude and frequency modulated. All pulses can drive 50Ω terminations.

Operational Modes
Continuous, Triggered, Double Triggered, Gated and Continuous Sweep. (See Sweep/Function Generator).
External Width: An external signal at the trigger input determines the output pulse width and period.

Pulse Period Range
Pulse period is selectable from 20 ns to 10,000s (50 MHz to 0.0001 Hz) with approximately 1% vernier.

Pulse Width
10 ns to 100 ms in 7 ranges. Maximum duty cycle is 70% for periods to 200 ns, decreasing to 50% for 20 ns periods. Control has nominal 50% duty cycle detent.

Transition Time
7 ns to 50 ms in 7 ranges, independently variable for leading and trailing edges.

Function Output
0 to ±15V into open circuit (0 to ±7.5V into 50Ω). Voltage attenuation 0 to 80 dB: to 60 dB in 20 dB steps, plus 20 dB continuous vernier.

TTL and $\overline{\text{TTL}}$ Pulses
Transition times less than 4 ns into 50Ω termination.

GENERAL

Stability
Amplitude, dc offset and frequency in linear mode to 500 kHz.
Short Term: ±0.05% for 10 minutes.
Long Term: ±0.25% for 24 hours.

Environment
Specifications apply at 25°C ±5°C after 30 min warm-up. Instrument operates from 0°C to ±50°C.

Dimensions
36.2 cm (14¼ in.) wide; 13.3 cm (5¼ in.) high; 38.1 cm (15 in.) deep.

Weight
8.8 kg (19.4 lb) net; 10.9 kb (24 lb) shipping.

Power
90 to 105V, 108 to 126V, 198 to 209V and 216 to 252V; 50 to 66 Hz; 50 VA nominal.

FACTORY/FOB

San Diego, CA

PRICE

Model 166 $2395

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