



Specification Sheet: 6127B Oscilloscope Calibrator

The Ballantine **6127B** is an accurate and simple way to calibrate a wide variety of oscilloscopes from low frequency units to instruments with bandwidths over 1 GHz. The **6127B** provides a variety of signals of precise voltage, current, timing and waveshape. The **6127B** can be operated manually or automatically using the IEEE-488 interface and Ballantine's automated software SCOPE-CAL™. Time saving controls include computation of percent deviation, repeat step increment, self checking and warning of invalid entries.



Volts/Division Mode (Used for calibration of vertical display accuracy and attenuator compensation)

High Impedance Output (into 1 MΩ): Range: 40 μV to 200 V in 1, 2, 5 steps with multiplier

Low Impedance Output (into 50 Ω): Range: 40 μV to 5 V in 1, 2, 5 steps with multiplier

Multiplier: 1, 2, 3, 4, 5, 6, 8, 10 divisions

Amplitude Accuracy: ±0.25% of reading ±1 μV

Variable Amplitude Deviation: Variable Range of ±9.9%. Digital deviation meter provides resolution of 0.1%.

Waveforms: Selectable outputs for all output levels. Square wave of 10 Hz, 100 Hz, 1 kHz, and 10 kHz. DC positive polarity. DC negative polarity.

Time/Division Mode (Real Time Markers for calibration of oscilloscope timebase accuracy and high frequency triggering)

Output Marker: 500 psec to 5 sec in 1, 2, 5 sequence

Marker Amplitude: ≥1 V pk into 50 W, 2 nsec to 5 sec >350 mV pk-to-pk at 1 nsec (1 GHz), >100 mV pk-to-pk at 500 psec (2 GHz)

Accuracy: ±0.005% of reading ±10 psec (2 nsec to 5 sec), ±0.005% of reading ±20 psec (0.5 nsec to 1 sec)

Variable Time Deviation: Variable deviation range of ±9.9% for marker and trigger period. Digital deviation meter provides resolution of 0.1%.

Timing Reference

Internal Time Base: An internal temperature compensated 10 MHz crystal oscillator provides accuracy of ±0.002% and long term stability to better than 1 part in 10⁻⁵ per month after 72 hours and temperature stability of better than 1 part in 10⁻⁵ from +4°C to +40°C after a one hour warm-up.

External Timing Reference: Input: 10 MHz, Input Amplitude: 1 V to 10 V rms., Source Impedance: 50 Ω

Milliamperes/Division (Current Amplitude Mode: Used to test current probe accuracy through front panel current loop)

Current Ranges: 1 mA to 100 mA in 1, 2, 5 steps with multiplier

Multiplier: 1, 2, 3, 4, 5, 6, 8, 10 divisions

Accuracy: ±0.25% of reading ±2 μA

Frequency: ±DC: Squarewave of 10 Hz, 100 Hz, 1 kHz, and 10 kHz

Calibrator Mode

(Used with 61272C Amplitude Comparator Head to test accuracy of oscilloscope's internal calibrator signal)

Amplitude Range: High Impedance: ±40 μV to ±200 V in 1, 2, 5 sequence

Low Impedance (50 Ω): ±40 μV to ±5 V in 1, 2, 5 sequence

Accuracy (Amplitude): ±0.25% of reading ±1μV

Accuracy of 50 Ω Impedance: ±1%

Frequency of UUT Calibrator Waveform: DC to >2 MHz

Frequency of Calibration Waveform: 1 kHz squarewave

Comparison Mode: Compares output of Volts/Div generator and calibrator of scope under test. Comparison is switched automatically at 100 Hz or alternate on command.

Low Distortion Pulse Mode

(Used to test oscilloscope attenuator compensation and input amplifier response)

	Low Edge (Amplitude Mode)	High Edge (Amplitude Mode)
Range	20 mV to 1 V pk-to-pk in 1, 2, 5 steps	1.2 V to 100 V pk-to-pk in 1, 2, 5 steps
Multiplier	1, 2, 3, 4, 5, 6, 8, 10 divisions	1, 2, 3, 4, 5, 6, 8, 10 divisions
Risetime	≤1.3 nsec from 100 mV to 1 V into 50 Ω ≤1.6 nsec from 20 mV to 50 mV into 50 Ω	<100 nsec
Load Resistance	n/a	≤1 MΩ load shunted by less than 18 pF
Polarity	Positive transition from negative voltage to ground	Positive transition from negative voltage to ground
Output Impedance	50 Ω ±1%	n/a
Waveshape	Squarewave with 50% duty cycle	Squarewave with 50% duty cycle. Leading edge aberrations within 2% of pk-to-pk.
Aberrations	±2% of squarewave amplitude after first 1.5 nsec	±2% of squarewave amplitude after first 1.5 nsec
Long Term Flatness	Droop and tilt within ±0.5%	Droop and tilt within ±0.5% after first 500 nsec
Frequency	10 Hz to 1 MHz to 6 decade steps	10 Hz to 100 kHz in 5 decade steps

All specifications are subject to change without notice.



Fast Rise Pulse

The Fast Rise Pulse Head provides a fast rise, low distortion pulse used for testing high bandwidth vertical amplifiers.

Amplitude: 1.1 V pk-to-pk, ±5%, adjustable ±10% into 50 Ω

Risetime: <180 psec into 50 Ω

Waveshape: Output is positive squarewave 50% duty cycle. Leading edge aberrations are less than ±2% of amplitude not exceeding 4% pk-to-pk.

Frequency: 10 Hz to 1 MHz in 6 decade steps

Trigger Output

Slaved to frequency of selected mode and marker. Time/Division Mode, trigger rate fixed at 100 nsec for marker outputs of 100 nsec and faster.

Modes: OFF, x1, +10, +100

Amplitude: ≥1 V into 50 Ω

Bus Address

Selected by switch accessible on rear panel and displayed on front panel.

Power

100/120/220/240 V AC, ±10%, 50 to 400 Hz, single phase sinusoidal, ~80 W.

Environmental

Meets or exceeds MIL-T-28800, Type III, Class 5 requirements, including Reliability and Maintainability. Satisfies EMI requirements per MIL-STD-461. CE-03, CS01, CS06, RE02, RE03.

Temperature: Operating: 0°C to 50°C, Storage: -55°C to 75°C

Humidity: Operating: 0 to 95% RH to 40°C, Storage: 0 to 95% RH to 50°C

Altitude: Operating: 3 km (10,000 ft), Storage: 15 km (50,000 ft)

Vibration: Operating: 0.015 inches pk-to-pk, 10 Hz to 55 Hz

Shock: Non-Operating: 30 G, 1/2 sine

Size & Weight

133mm (5.22 in) H x 425mm (16.75 in) W x 484mm (19.1 in) D

Weight: 15.2 kg (33.5 lbs.); Shipping: 17.7 kg (39 lbs.)

Order Information

Model	Description
6127B	Programmable Oscilloscope Calibrator with IEEE-488
Heads	
For 500 MHz Scopes	
61252	Fast Rise Pulser
61278	Low Frequency Head
For 1 GHz Scopes	
61271C	Fast Rise Head
61274A	Direct Output Cable
Accessories	
10650A	Capacitance Standardizer for Oscilloscopes
61272C	Amplitude Comparator Head
61277A	Kit Containing 12619A, 12621A (2), 12630A (2), 12680A (2), 12681A, 12682A, 12683A, 12684A, 12685A, 12686A, 12687A, 12688A, 12689A, 12690A, and 89-11103-1A
89-10753-1A	Rack Slide Kit
89-11175-1A	Protective Front Cover. Storage for two Heads and 61274A
89-11176-1A	Protective Rear Cover. Storage for power cord

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