6310A

2 Hz to 1 MHz TEST OSCILLATOR

- ☐ **SELECTABLE OUTPUT IMPEDANCES.**
- ☐ **OUTPUT TO 14 VOLTS RMS/600 OHMS.**
- ☐ **5-DIGIT FREQUENCY READOUT.**
- ☐ **BALANCED OR SINGLE-ENDED OPERATION. TERMINATED AND UNTERMINATED. 600 AND 75 OHMS.**
- ☐ **HIGH SPECTRAL PURITY. TOTAL DISTORTION GREATER THAN -60 dB.**

This solid-state Ballantine Test Oscillator provides stable, accurate low distortion sine wave test signals for laboratory or production measurements. The instrument has a wide frequency range of 2 Hz to 1.05 MHz continuously variable across 6 decades. It uses monolithic integrated circuit, operational wideband amplifiers in a state-of-the-art phase shift oscillator design. A five digit LED display frequency counter, with quartz crystal clock, provides precise display of the output frequency. Rapid readouts of low frequencies are made possible by low frequency multiplier digital techniques.

Two output impedances, as well as selection of balanced and single ended output modes, are available from the front panel providing 250 mW into either 600 Ohms or 75 Ohms. The phase shift oscillator delivers flat output throughout the entire frequency range. Flatness, as well as very low total distortion, is obtained by a unique Ballantine gate-controlled, peak sampling, automated level control circuit.

Hum, noise and harmonic distortion are greater than 60 dB below the output frequency to 100 kHz. The transformerless solid-state output circuit provides 27 Volts rms open-circuit, or 14 Volts rms into 600 Ohms. A total of 84 dB of attenuation is provided in 10 dB and 1 dB steps, plus a 5 dB continuously variable control An internal analog meter is calibrated to read volts or dBm referenced to 75 Ohms and 600 Ohms. The test oscillator may safely be operated offground to ± 500 volts.

The Ballantine 6310A is ideally suited for laboratory, production and maintenance jobs where fast, accurate wide band stimuli and measurements are required. It is specfically designed to serve as the low end test oscillator for frequencies not covered by conventional high frequency signal generators that normally range from a 500 kHz or 1 GHz bottom to the top of their band. It is applicable to communications testing, telephone and telegraphic carrier equipment, vibration studies, filter networks, audio and video amplifiers. The 6310A is also useful for making Bode loop gain plots on amplifiers and is excellent for calibrating voltmeters and digital multimeters because of its flatness, accurate attenuator and output level meter.

The 6310A-OPT60 provides IEEE-488 programming capability for frequency, output mode and level. The 6310A-MOD915 is the military SG-1168/U and is ruggedized for field use to include splash-proof enclosure, EMI integrity and full MIL-T-28800; Class 4 environmental compliance.

Ballantine Laboratories, Inc.
FIVE DECADES OF INNOVATION IN ELECTRONIC INSTRUMENTATION

SPECIFICATIONS

FREQUENCY SPECIFICATIONS

Range: 2 Hz to 1.05 MHz; 6 decades.

Indication: 5 digit counter, 0.4 inch LED display.

Resolution:

0.1 Hz,	2Hz to 100 Hz
1.1 Hz,	100Hz to 1 kHz
10 Hz,	1kHz to 100 kHz
100 Hz,	100kHz to 1.05 MHz

Accuracy: ±(0.05% + 1 LSD) as monitored by internal 5 digit frequency counter with quartz crystal clock.

OUTPUT SPECIFICATIONS

Form: Sine Wave.

Amplitude:

250 mW max. output power.

600 Ohms Balanced Mode:

12.25 V rms max. into 600 Ohms.

24.50 V rms max. into open circuit.

600 Ohms Unbalanced Mode:

12.25 V rms max. into 600 Ohms.

14 V rms max. into open circuit.

75 Ohms Balanced or Unbalanced Mode:

4.33 V rms max. into 75 Ohms.

8.66 V rms max. into open circuit.

Attenuator: 84 dB total range.

Resolution: 70 dB in eight 10 dB steps (-50 dB to + 20 dB). 9 dB in ten 1 dB steps (-9 dB to 0 dB). 5 dB continuously variable control.

Accuracy: ±(0.2 dB + 0.02 dB per dB set).

Output Level Monitor: Voltmeter monitors level between 1 dB step attenuator and output amplifier 10 dB step attenuator. Two 12 dB scales (600 Ohm and 75 Ohm reference). Two voltage scales; 0.4 to 1.4 Volts and 0.1 to .43 Volts rms. Accuracy ± 2% of full scale.

Amplitude Stability:

±0.01% per °C temperature change typical

±0.03% typical drift with constant load over 10 minutes.

±0.03% typical with change in mains voltage.

Flatness: Output voltage amplitude variation no more than ± 0.5 dB as frequency is varied from 2 Hz to 1.05 MHz with 1 kHz reference. Typical variation less than ± 0.2 dB from 50 Hz to 30 kHz

Modes:

600 Ohms balanced.	2 Hz to 100 kHz*
600 Ohms unbalanced.	2 Hz to 1.05 MHz
75 Ohms unbalanced.	2 Hz to 100 kHz*
75 Ohms unbalanced.	2 Hz to 1.05 MHz

*usable to 1.05 MHz

Termination: Unterminated. 600 Ohms internal. 75 Ohms internal.

Balance: Output unbalance is less than ± 0.1% from 50 Hz to 100 KHz referenced to 1 KHz.

Protection: Will withstand continuous short circuit or open circuit operation, and accidentally applied voltages to 24 Volts peak to peak with output fuse protection to 250V Peak.

Distortion and Spectral Purity:

Total Harmonic Distortion: 2 Hz to 100 kHz less than 0.1% (60 dB below fundamental). 100 kHz to 1.05 MHz less than 1% (40 below fundamental).

Residual AM: Less than 0.1% rms at 0 dBm over a 20 Hz to 15 kHz bandwidth centered on the selected output frequency.

Residual FM: Less than 0.01% of the selected output frequency at 0 dBm output level.

Hum and Noise: Less than 0.1% of the selected output levels above −10 dBm.

Off-Ground Operation: The output circuits may be operated up to ± 500 Volts dc off case ground.

ENVIRONMENTAL

	6310A	6310A-MOD 915
Operating Temp.:	0 to 50° C	-10 to 50 °C
Storage Temp.:	-40 to +75°	-51 to +85°
Humidity:	80% RH to 50° C	Complies with
(No condensation)	95% RH to 35° C	MIL-T-28800; Class 4
Altitude:		
Operating:	To 3Km (10,000 ft.)	Complies with
Storage:	To 15Km (50,000 ft.)	MIL-T-28800; Class 3
Shock:	10G, ½ Sine, 11 rms; 2 shocks in each of 3 axes.	Complies with MIL-T 28800; Class 3
Vibration:	15 minutes at 0.25 mm double amplitude, to limit of 2G, from 10 Hz to 55 Hz to 10 Hz in one minute cycle	Complies with MIL-T-28800; Class 3
Drip Proof:	N/A	Complies with MIL-T-28800 Style C, Class 3
Safety:	Designed to meet UL 1244 and MIL-T-28800; Class 3, Style E	Complies with MIL-T-28800; Style C, Class 3
Case:	Aluminum Case, die cast frames, vinyl clad aluminum covers, side carry handle tilt stand.	Complies with MIL – T-28800; Class 3, Style C Drip proof enclosure with snap on protective panel cover. Green case, color 24052 per FED-STD-595.
Case Dimensions:		
Height:	131 mm (5 3/16 in.)	134 mm. (5 9/32 in.)
Width:	285 mm. (11¼ in.)	292 mm. (11½ in.)
Depth:	319 mm. (12 9/16 in.)	352 mm. (13 ⅞ in.)
(with cover)	N/A	377 mm. (14 ⅞ in.)
Weight:	4.60 Kg. (10 lbs. 2 oz.)	5.34 Kg. (11 lbs. 12 oz.
(with cover)	N/A	5.68 Kg. (12 lbs. 8 oz.)

Power: 100V/120V/220V/240V; ±10% 50 to 400 Hz. 50VA max.

Supplied Accessories

1 each Mains Power Cable.
1 each Instruction Manual.

OPTIONS

OPT 60 IEEE Interface:
Programming of frequency, output mode, and level.
Contact factory.

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Specifications subject to change without notice.

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