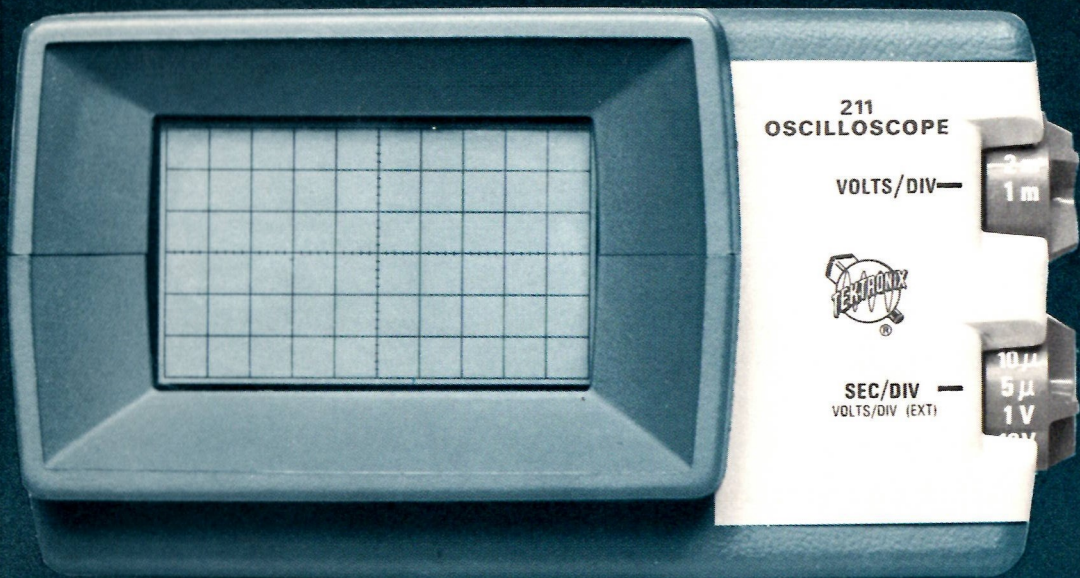


# Introducing



Actual Size

the first  
laboratory-quality  
miniscope

# 211



**TEKTRONIX®**

committed to  
technical excellence

- 3 LB, 3 x 5 $\frac{1}{4}$  x 9 INCHES
- UP TO 5 HOURS OPERATION FROM INTERNAL BATTERY PACK
- 1 mV/DIV TO 50 V/DIV, INTEGRAL 1 M $\Omega$  PROBE
- ALL SOLID STATE
- DOUBLE INSULATED
- DESIGNED FOR SEVERE ENVIRONMENTS

The 211 is optimized for field maintenance and other applications where space and portability are primary considerations. Though small, it's complete. The 211 is the first laboratory-quality miniscope. It offers performance plus unmatched portability and carrying convenience at a lower price than many other 500-kHz scopes.

In many industrial applications, it's frequently necessary to "float" an oscilloscope. The 211 may be elevated to 700 volts above ground when operated from batteries, and 250 volts RMS above ground from AC. Cautions should be observed when connecting the oscilloscope probe to the test point. The 211 meets or exceeds IEC standards for class II instruments.

The 211 is easy to use. Deflection factors from 1 millivolt to 50 volts/division, and sweep rates from 5 microseconds to 200 milliseconds/div are read out directly from the front panel, where they are related easily to the CRT display.

Trigger controls are simplified to one rotary control. A bright baseline is provided at all sweep rates, even with no signal in. When a signal is received, the oscilloscope triggers on the signal. Internal and external trigger circuits provide stable displays from about seven hertz to at least 500 kilohertz.

Some applications do require an adjustable trigger level. Turning the control clockwise causes the scope to trigger on the positive slope of the triggering waveform. Rotating the control further clockwise causes the scope to trigger on the negative slope of the triggering waveform.

The 211 is equipped with an integral flip stand which tilts the scope to a convenient viewing angle for bench-top operation. The integral probe and power line wrap around a recessed area in the case. They are out of the way, and the user knows exactly where they'll be when he reaches the next job.

An oscilloscope used in maintenance applications should be ready to travel when needed. This means that it has to be easy to service, to eliminate the purchase of back-up scopes. The 211 disassembles quickly and easily into its modular components for access to internal components.



## VERTICAL DEFLECTION

**Deflection Factor**—1 mV/div to 50 V/div in 15 calibrated steps (1-2-5 sequence), accurate within 5%. Uncalibrated, continuously variable between steps and to at least 150 V/div.

**Bandwidth**—DC to at least 500 kHz from 10 mV/div to 50 V/div, reducing to at least 100 kHz at 1 mV/div. Lower 3-dB-down point AC coupled, is 2 Hz.

**Input R and C**—Approx 1 M $\Omega$  paralleled by approx 130 pF via permanently attached signal acquisition probe.

**Insulation Voltage**—500 V RMS or 700 V (DC + peak AC) when operated from internal batteries, with the line cord stored and the plug protected. When operated from AC, line voltage plus floating voltage not to exceed 250 V RMS; or 1.4 x line + (DC + peak AC) not to exceed 350 V.

**Maximum Input Voltage (probe tip to common)**—600 V (DC + peak AC), 600 V peak-to-peak AC, (5 MHz or less) from 50 V/div to 0.1 V/div; 600 V (DC + peak AC), AC not over 2 kHz from 50 mV/div to 1 mV/div.

## HORIZONTAL DEFLECTION

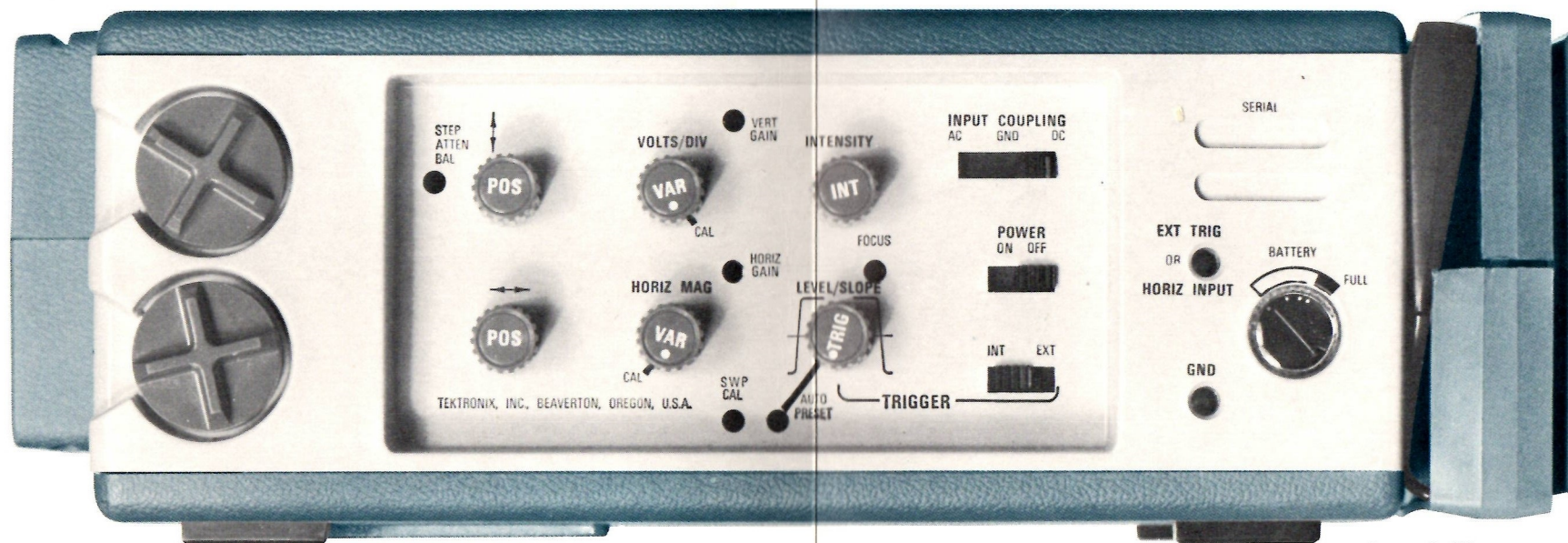
**Time Base**—5  $\mu$ s/div to 200 ms/div in 15 calibrated steps (1-2-5 sequence); accurate within 5% over center 8 divisions.

**Variable Magnifier**—Increases each sweep rate by at least 5 times. Continuously variable magnification extends the maximum sweep rate to at least 1  $\mu$ s/div.

**External Horizontal Input**—1 and 10 V/div within 10%; DC to 75 kHz. Approx 0.5 M $\Omega$  paralleled by approx 30 pF. Maximum input voltage, 200 V (DC + peak AC), 200 V P-P AC, referenced to probe common.

## TRIGGER

**Modes**—Internal, triggers on signals of at least 0.2 division from seven hertz to 500 kilohertz. External, triggers on signals of 1 volt to 20 volts from seven hertz to 500 kilohertz. Sweep free-runs in absence of trigger signal or for trigger-repetition rates below seven hertz in both internal and external modes. Maximum external input voltage, 20 volts (DC + peak AC), 20 V P-P AC, referenced to probe common.



# The TEKTRONIX 211

Actual Size

## CRT

**CRT**—6 x 10-div display area; each div is approx 0.2 inch. CRT uses low-power cathode, providing a useful display approx one second after turn-on. P31 phosphor. 1-kV accelerating potential.

**Graticule**—Internal, black, nonilluminated.

## Dimensions and Weights

Height	3.0 in	7.6 cm
Width	5.25 in	13.3 cm
Depth	8.9 in	22.6 cm
Net weight without accessories	3.0 lb	1.4 kg
Domestic shipping weight	7.5 lb	3.4 kg
Export-packed weight	12.0 lb	5.4 kg

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## ENVIRONMENTAL CAPABILITIES

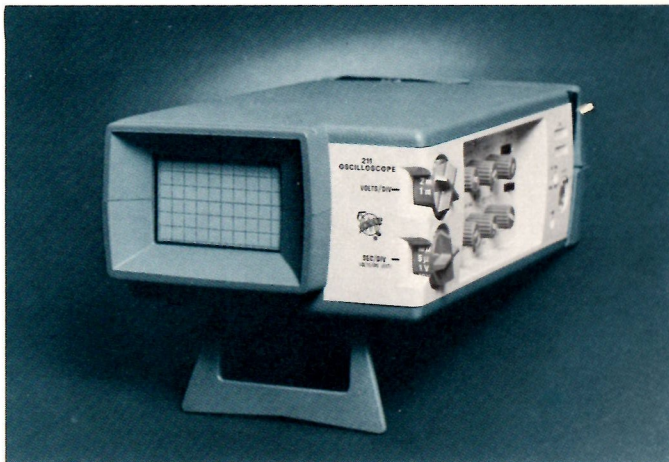
**Ambient Temperature**—Operating,  $-15^{\circ}\text{C}$  to  $+55^{\circ}\text{C}$ . Charging,  $0^{\circ}\text{C}$  to  $+40^{\circ}\text{C}$ . Storage,  $-40^{\circ}\text{C}$  to  $+60^{\circ}\text{C}$ .

**Altitude**—Operating: 25,000 feet; maximum ambient temperature rating is decreased by  $1^{\circ}\text{C}/1000$  feet above 15,000 feet. Nonoperating, 50,000 feet.

**Vibration**—Operating and nonoperating: 15 minutes along each of the 3 major axes at a total displacement of 0.025 inch P-P (4 g's at 55 Hz) with frequency varied from 10 to 55 to 10 Hz in 1-minute cycles.

**Shock**—Operating and nonoperating: 150 g's,  $\frac{1}{2}$  sine, 2-ms duration, 2 shocks per axis in each direction for a total of 12 shocks.

**Humidity**—Operating and storage: 5 cycles (120 hours) to 95% relative humidity referenced to MIL-E-16400F.



## OTHER CHARACTERISTICS

**Power Sources**—Internal DC source contains 10 size "AA" NiCd cells provide up to 5 hours operation. Operating time depends on trace intensity, operating temperature and temperature during previous battery charge. Maximum operating time is achieved at  $+20^{\circ}\text{C}$  to  $+30^{\circ}\text{C}$  charge and operating temperature. Internal charger provides for charging the batteries when connected to the AC line with the instrument turned off. A battery meter indicates full charge at 15 volts and discharged at 10 volts. DC operation is automatically interrupted when battery charge drops to 10 volts to protect batteries against deep discharge. Full recharge requires approximately 16 hours. Extended-time charges won't damage the batteries.

External AC source, 110 to 126 V, 58 to 62 Hz, 2 W maximum at 126 VAC. Can be operated between 104 and 110 volts with resulting slow discharge of internal batteries. Power options are available .



The 211 covers an extremely wide range of applications including industrial controls, mobile electronic facilities, audio communications, telephone and military applications, office equipment, logic probing, numerical control equipment, electronic scales, motor controls, interoffice and interplant communications, avionics, marine electronics, frequency translator maintenance and others.



**Standard Accessories**—Viewing hood (016-0199-00); instruction manual (070-1160-00); operator's manual (070-1163-00); carrying case (016-0512-00).

**Order 211 OSCILLOSCOPE, includes batteries ..... \$545**

**POWER OPTIONS**

**Option 1 for 220 to 250 V, 50 Hz, includes batteries ..... \$545**

**Option 2 for 90 to 110 V, 50 Hz includes batteries ..... \$545**

**Option 3 for 110 to 126 V, 400 Hz, includes batteries ..... \$545**