100 MHz Analog Oscilloscope

2190B

- **Dual time base oscilloscope (2 channel)**
- **5mV/division sensitivity**
- **Sweeps to 5ns/division**
- **23 calibrated ranges, main time base**
- **Signal delay line**
- **15 kV accelerating voltage**
- **Channel 2 output**

Specifications

model 2190B

VERTICAL AMPLIFIERS (CH 1 and CH 2)	
Sensitivity	5mV/div to 5 V/div. 1 mV/div to 1V/div (at X5 MAG)
Attenuator	10 calibrated steps in 1-2-5 sequence. Vernier control provides fully adjustable sensitivity between steps, adjustment range 1/1 to 1/2.5
Accuracy	±3% (±5% at X5 MAG)
Input Impedance	1MΩ ±3%
Input Capacitance	25 pF ±10pF
Frequency Response	DC: DC to 100 MHz (-3 dB)
X5 MAG	DC to 20 MHz (-3 dB)
AC	10Hz to 100 MHz (-3 dB)
Rise Time	3.5 ns (Overshoot ≤5%)
Signal Delay Time	Variable
Square Wave Characteristics	Overshoot less than 5%, 10 mV/div range
	Other ranges within 5% additional
Maximum Input Voltage	400V (DC + AC peak)
VERTICAL AMPLIFIERS	
Operating Modes	CH 1, CH 2, Dual, Add
Delay Time Between Channels	Within 1 ns between CH 1 and CH 2
Crosstalk	30:1 at 100 kHz
SWEEP SYSTEM	
Operating Modes	
A	A sweep
B	Delayed B sweep
B TRIGGERED	B sweep triggered after delay
A Time Base	
Sweep Mode	Auto, normal
Sweep Time:	5s to 20ns/div., 23 steps in 1-2-5 sequence with variable control
Accuracy	± 3%
Hold Off Time	Continuously variable. Adjustment range from normal to 1.5 times the sweep time
B Time Base	
Delay Method	Continuous delay. Triggered delay
Sweep Time	20ns. to 0.5s/div., 23 steps in 1-2-5 sequence
Accuracy	± 3%
Delay Time	Start point: 0.5 div to + 0.3 div. End point: 10 div + 1 div
Delay Jitter	Within 1/10,000 of full scale sweep time
TRIGGERING	
A Trigger	
Source	CH 1, CH 2, LINE, EXT
Sensitivity	30Hz to 110MHz
TV-V	20Hz - 30kHz
TV-H	3kHz - 100kHz
Slope	+ or -
B Trigger	The A trigger is also the B trigger

EXTERNAL TRIGGER	
Input Impedance	1mΩ, 30pF
Maximum Input Voltage	300V (DC + AC peak)
HORIZONTAL AMPLIFIER	
X-Y Mode	X Axis = CH 1. Y Axis = CH 2
Sensitivity	5 mV/div to 5 V/div, CH 1 and CH 2
Accuracy	±3% calibrated position, ±6% using x10 MAG
Frequency Response	DC to 2 MHz (-3dB)
CH2 (Y) OUTPUT	
Output Voltage	Approx. 100mV/div open circuit Approx. 50 mV/div into 50Ω
Freq. Response	50 Hz to 30 MHz.
Output Impedance	approx. 50Ω
CRT	
Type	Rectangular with integral graticule
Display Area	8 x 10 div (1 div = 1 cm)
Accelerating Voltage	15kV
Phosphor	P31
Scale Illumination	None
Trace Rotation	Electrical, front panel adjustable

Other Specifications

Z Axis (Intensity Modulation)	Sensitivity: 3 V or greater, TTL level. Negative polarity increases brightness
Input Impedance	15 kΩ
Usable Freq. Range	DC to 3.5 MHz
Maximum Input Voltage	20 V (DC + AC peak)
CAL/Probe Compensation	
Waveform	Positive going squareware
Output Voltage	0.5 V p-p ±3%
Frequency	Approx. 1kHz
Duty Cycle	50 ± 5%
Power Requirements	100/120/220/240/ VAC ±10%, 50/60 Hz, approximately 55 W
Dimensions (HxWxD)	12.76 x 15.68 x 5.2" (324 x 398 x 132 mm)
Weight	18.7 lbs (8.5 kg)
ENVIRONMENT	
Within Specified Accuracy	50° to 95°F (10° to 35°C), 85% maximum RH
Full Operation	32° to 104°F (0° to +40°C), 85% maximum RH
Storage	-4° to 158°F (-20°to +70°C)

Accessories

Three Year Warranty

SUPPLIED: Instruction Manual, Two PR-37A x1/x10/Ref. Probes or equivalent, AC Power Cord, Spare Fuse

OPTIONAL: PR-32A Demodulator Probe, PR-46A x10 Probe, PR-37A x1/x10/REF. Probe, PR-100A x100 Probe, PR-55 High Voltage x1000 Probe, LC-210A Carrying Case