

THE WORLD'S MOST POPULAR PORTABLES

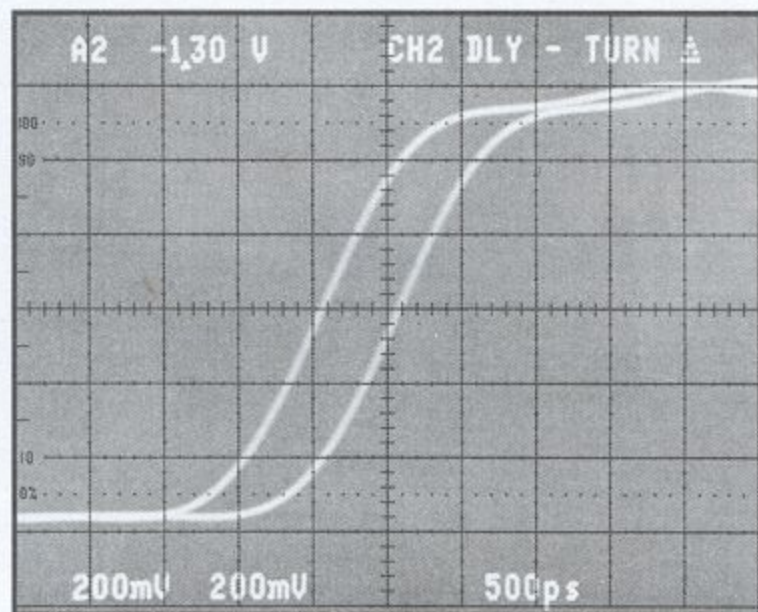
Tek state-of-the-art technology makes possible the 2465B's 400 MHz bandwidth and pushes the limits again by increasing the 2445's bandwidth to 200 MHz. These scopes also provide pushbutton measurements never before seen in analog instruments. In addition, new pushbutton probes take the full bandwidth to the probe tip - where you really need it.

No other portable oscilloscopes answer so many diverse, demanding requirements in research and design, manufacturing and service. You can count on the 2465B and the 2445B for needs ranging from waveform observation and quality measurement to fully automated testing.

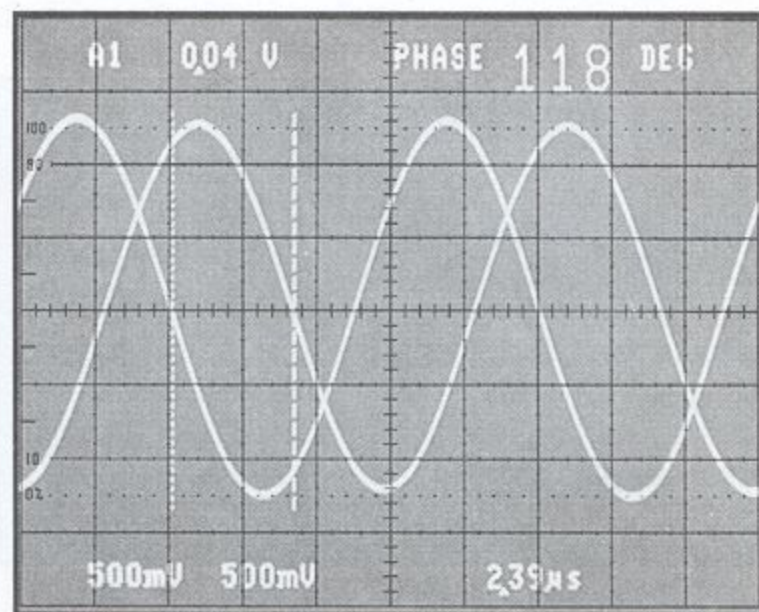
HIGH PERFORMANCE - THE FIRST PRIORITY

Both the 400 MHz 2465B and the 200 MHz 2445B achieve timing accuracies to 1%. You can make high-resolution timing measurements with sweep speeds to 500 ps/div in the 2465B, to 1 ns/div in the 2445B. And trigger on signals to 500 MHz and 250 MHz on the two instruments respectively - thus extending the usefulness of each scope well beyond its vertical bandwidth.

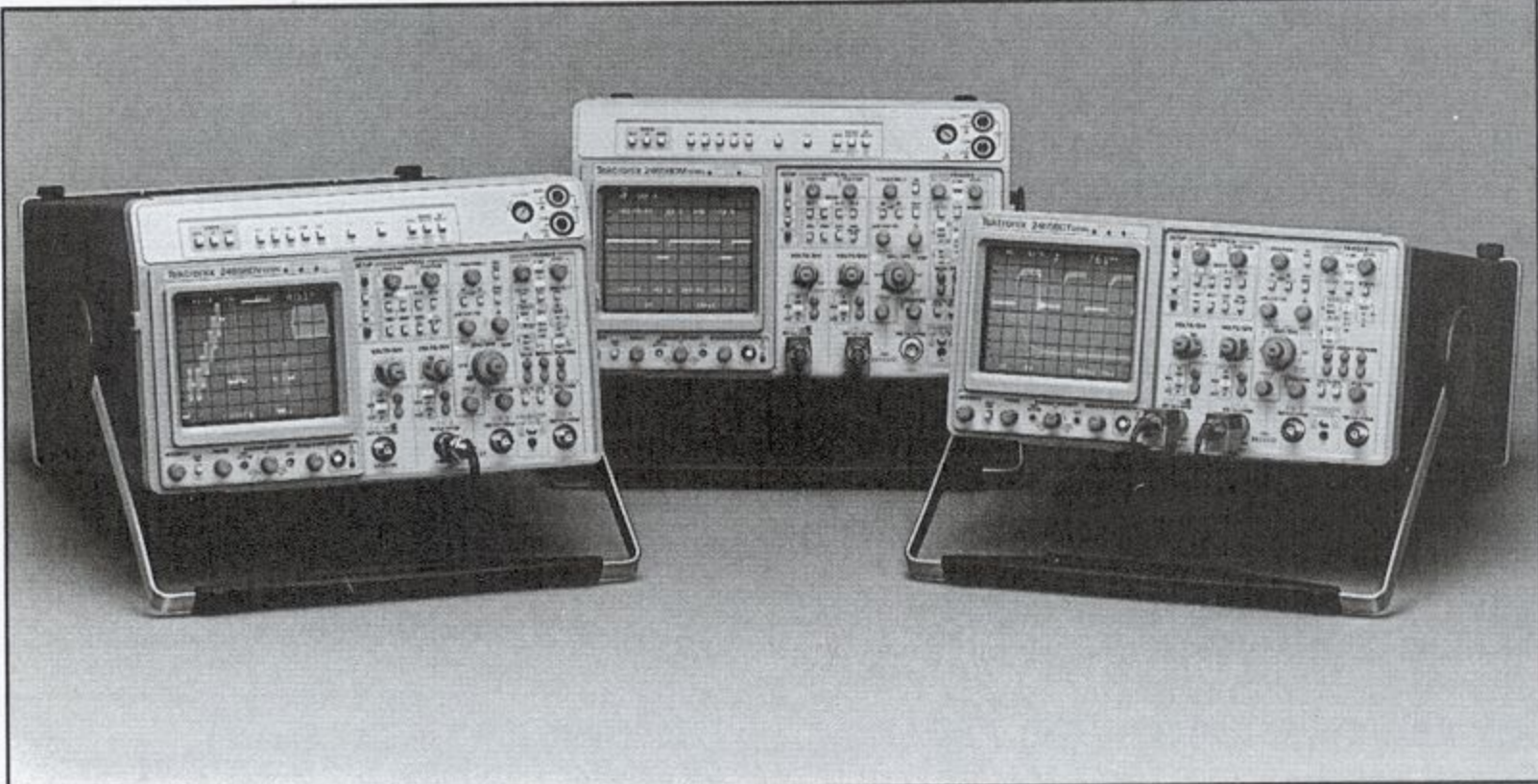
True four-channel capability includes two channels optimized for logic signals. You can also make three-channel X-Y comparisons such as multiple transducer measurements.



Adjustable delay increases accuracy. A front-panel knob adjusts the Channel 2 delay to exactly match the Channel 1 delay from the probe tip.



Measure phase shift in degrees or percent. The continuously-calibrated variable sec/div control sets one cycle (360° or 100%) to five horizontal divisions. The time cursors make phase and percentage measurements directly.



SPECIAL PACKAGES PROVIDE A BROAD RANGE OF FUNCTIONS

These models include multi-instrument capabilities while reducing rack or bench space, equipment cost, and programming complexity. As preconfigured packages, they offer significant savings over the cost of combining individual options. Any of these three packages make a good choice for your system, as all include the GPIB interface and the extended Counter/Timer/Trigger (CTT) measurements.

2465BCT PRECISION TIMING SCOPE

The *2465BCT Precision Timing Scope*, which includes the CTT/Word Recognizer and GPIB, is ideal for making the precise timing measurements needed for communications, office, and computer-related equipment, or in microprocessor-controlled systems.

2465BDM MULTIFUNCTION SCOPE

The *2465BDM Multifunction Scope* includes a GPIB-controllable digital multimeter in addition to the CTT/WR and GPIB. Its applications as a self-contained, multi-purpose instrument extend into government/military electronics, avionics, depot service, and ATE.

2465BDV FULL-FEATURED SCOPE

For more varied applicability, the *2465BDV Full-Featured Oscilloscope* adds Video Waveform Measurement capability as well as providing GPIB, CTT/WR, and DMM. It is especially suited to the design, manufacture, and service of raster-scan devices and high-resolution video equipment.

PRODUCT CONFIGURATION GUIDE

Features	Standard Models		Special Packages		
	2465B	2445B	2465BDV	2465BDM	2465BCT
Bandwidth	400 MHz	200 MHz	400 MHz	400 MHz	400 MHz
General Purpose Interface Bus	Opt. 10	Opt. 10	Included	Included	Included
Counter/Timer/Trigger Word Recognizer	Opt. 09	Opt. 09	Included	Included	Included
Digital Multimeter	Opt. 01	Opt. 01	Included	Included	—
Video Measurement System	Opt. 05	Opt. 05	Included	—	—
Two additional probes	Opt. 22	Opt. 22	Included	Included	Included
Rackmount	Opt. 1R* ¹	Opt. 1R* ¹	Opt. 2R	Opt. 2R	Opt. 1R
Probe Power	Opt. 11	Opt. 11	—	—	—
Warranty	3 years, parts and labor		3 years, parts and labor		

*¹Specify Opt 2R if Opt 01 (DMM) is ordered.

CHARACTERISTICS

Characteristics are common to all 2400 Series analog scopes except where indicated. For complete specifications, call your local Tektronix sales office or the Tek National Marketing Center: 1-800-426-2200, Ext. 99.

VERTICAL SYSTEM

Deflection Factor – 2 mV/div to 5 V/div, continuously variable between V/div settings (CH 1 and CH 2); 100 mV/div and 500 mV/div (CH 3 and CH 4).

Deflection Factor Basic Accuracy – $\pm 2\%$ (measured at any V/div setting with a 4- to 5-div signal, centered on screen; CH 1/CH 2); $\pm 10\%$ (CH 3/CH 4).

Bandwidth Limit – 20 MHz

AC-Coupled Lower (-3 dB Point) – 10 Hz or less.

Input Coupling and Max Voltage – (1 M Ω) ac, dc, GND; Max input voltage: 400 V (dc + peak ac) (50 Ω); Max input voltage: 5 Vrms.

Input R and C – 1 M Ω and 15 pF or 50 Ω (nominal).

Channel Isolation – $\geq 100:1$ at 100 MHz, $\geq 50:1$ at nominal BW (CH 1/CH 2), $\geq 50:1$ at 100 MHz (CH 3/CH 4).

Frequency Response (-3 dB Bandwidth) –

Instrument	+15°C to 35°C	-15°C to +15°C, +35°C to 55°C
2467B	400 MHz (≥ 5 mV/div)	300 MHz
2465B	350 MHz (2 mV/div)	—
2445B	200 MHz	150 MHz

Standard accessory probe or internal 50 Ω termination used.

HORIZONTAL SYSTEM

Display Modes – A (main sweep), A Intensified, ALternate A INTEN with B (delayed sweep), and B. In X-Y mode, CH 1 provides X-axis (horizontal) deflection.

A Sweep Time Base Range – 2465/67B: 500 ms/div to 5 ns/div (to 500 ps/div with X10 mag); 2445B: 500 ms/div to 10 ns/div (to 1 ns/div with X10 mag).

B Sweep Time Base Range – 2465/67B: 50 ms/div to 5 ns/div (to 500 ps/div with X10 mag); 2445B: 50 ms/div to 10 ns/div (to 1 ns/div with X10 mag).

Continuously Variable Timing Control – calibrated between sec/div settings. Extends A Sweep to 1.5 s/div.

AUTOMATIC MEASUREMENTS ACCURACY

+15°C to +35°C, Specifications based on noise $< 0.1\%$ of peak-to-peak input signal.

Period – 0.9% +500 ps.

Volts – (5% + 5 mV +1 LSD + 0.5 mV x probe attenuation) to 1 MHz.

Rise Time, Fall Time – 5% + 3 ns (for transition times > 10 ns). These rise & fall times based on measurements of 20% and 80% extrapolated to 10% and 90%. Pulse overshoot, undershoot $< 5\%$ of pk-pk signal.

Time A-B (between two voltages) – 0.9% + 3 ns (+ 0.5 ns if from CH 1 to CH 2) + 5% of start and stop event transition times. Voltages $< 10\%$ of either peak.

Time A-B (from % to %) – 0.9% (+ 3 ns if from CH 1 to CH 2) + 5% of start and stop event transition times.

Pulse Width – 0.9% + 1 ns (transition times $< 10\%$ of measured interval).

TIMING ACCURACY

Method	Accuracy
A Sweep	$\pm (0.7\%$ of time interval + 0.6% of full scale)
ΔT using cursors	$\pm (0.5\%$ of time interval + 0.3% of full scale)
ΔT using sweep delay	$\pm (0.3\%$ of time interval + 0.1% of full scale) + 200 ps
Delay from A trig to B sweep	$\pm (0.3\%$ of delay setting + 0.6% of full scale) + (0 to -25 ns)

100 ms/div and faster; +15°C to +35°C; X 10 mag off

TRIGGERING (CH 1 or CH 2 Source)

DC Coupled – 0.35 division.

Noise Reject Coupled – ≤ 1.2 divisions.

HF Reject Coupled – 0.5 division from dc to 30 kHz.

LF Reject Coupled – 0.5 division from 80 kHz.

AC Coupled – 0.35 division from 60 Hz.

Trigger Level Range – ± 18 x V/div setting (CH 1 and CH 2); ± 9 X V/div setting (CH 3 and CH 4).

Jitter –

2467B: ≤ 100 ps with 5 div. of 350 MHz at 500 ps/div.

2465B: ≤ 50 ps with 5 div. of 300 MHz at 500 ps/div.

2445B: ≤ 100 ps with 5 div. of 150 MHz at 1 ns/div.

OTHER SIGNAL INPUTS AND OUTPUTS

Z-Axis Input, CH 2 Signal Out, A & B Gate Out

DISPLAY

Graticule Size – 8 x 10 cm; 6.8 x 8.5 cm for 2467B.

Writing Speed –

	2467B	2465B
Visual (room light)	20 div/ μ s	≥ 4 div/ns
Photographic w/o pefogging (C30 camera; f1.9, ASA 3000 film)	50 div/ μ s	≥ 10 div/ns

Cursors – Volts, Time, 1/Time.

POWER REQUIREMENTS

Line Voltage Ranges – 115 V: 90 to 132 VAC; 230 V: 180 to 250 VAC.

Line Frequency – 48 to 440 Hz.

Maximum Power Consumption – 120 W (180 VA) for fully-optioned instrument.

ENVIRONMENTAL AND SAFETY

See page 90.

EFFECTIVE SAMPLING RATE

24678 Opt. 10 with DCS01 = 100 GS/s.

PHYSICAL CHARACTERISTICS

	2467B		Rackmount	
Dimensions	mm	in	mm	in
Width w/handle	338	13.3	483	19.0
Height w/feet, pouch	190	7.5		
w/o pouch	160	6.3	178	7.0
Depth w/front cover	472	18.6	419	16.5
handle extended	533	21.0		
Weight \approx	kg	lb	kg	lb
Net w/accessories and pouch	10.9	24.0		
w/o accessories or pouch	9.7	21.3	4.0*	8.8*
Shipping	14.6	32.1	6.3*	13.8*

	2465B/2445B		Rackmount	
Dimensions	mm	in	mm	in
Width w/handle	338	13.3	483	19.0
Height w/feet, pouch	190	7.5		
w/o pouch	160	6.3	178	7.0
Depth w/front cover	434	17.1	419	16.5
handle extended	508	20.0		
Weight \approx	kg	lb	kg	lb
Net w/accessories and pouch	10.2	22.4		
w/o accessories or pouch	9.3	20.5	4.0*	8.8*
Shipping	12.8	28.2	6.3*	13.8*

* Weight of conversion kit only. Rear support kit