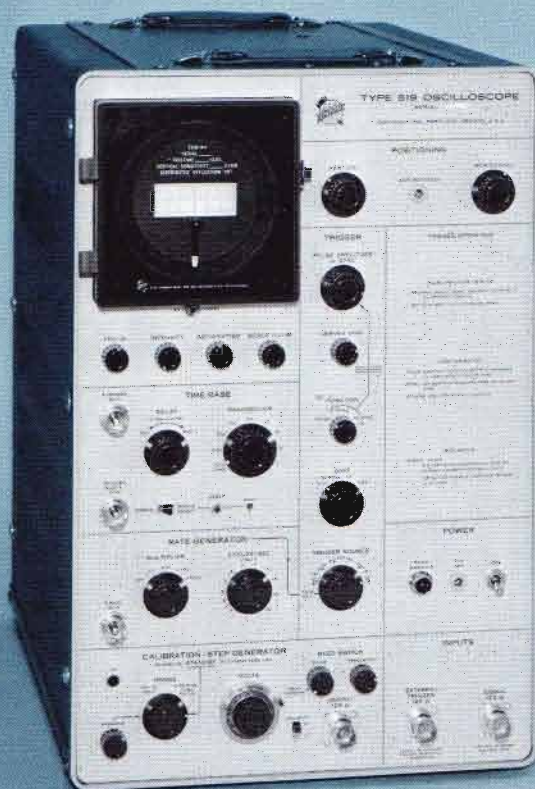


TYPE 519

DC-to-1 GHz OSCILLOSCOPE



- **SINGLE-SHOT PHOTOGRAPHS AT 2 NS/CM**
- **0.004-INCH SPOT SIZE**
- **SENSITIVE WIDEBAND TRIGGER SYSTEM**
- **SYNCHRONIZATION TO OVER 1 GIGAHERTZ**
- **VSWR, 1.25, OR LESS, TO 1 GIGAHERTZ**
- **DISTRIBUTED-DEFLECTION CRT**
- **BUILT-IN DELAY LINE**

The Tektronix Type 519 Oscilloscope is a calibrated, high-speed, laboratory instrument designed for observation, measurement, and photographic recording of fractional nanosecond risetimes. A 2 x 6 cm viewing area, coupled with 24-kV accelerating potential, affords bright displays with excellent resolution. Performance features include: bandwidth from DC to beyond 1 gigahertz, risetime less than 0.35 ns, deflection factor ≤ 10 V/cm, linear sweeps to 2 ns/cm, sweep delay through 35 ns, and a wideband trigger system. The single unit houses a fixed signal delay line, a convenient sweep-delay control, a pulse-rate generator, a standard amplitude and waveshape generator, and regulated power supplies and high-voltage supply. Only one connection is necessary for normal operation—a connection of the signal from the device under test.

Combining simple operation with laboratory precision and reliability, the Type 519 ideally suits single-shot or random nuclear events. In addition, the bandwidth permits applications to general measurements where oscilloscope risetime must be less than signal risetime.

CHARACTERISTIC SUMMARY

VERTICAL

BANDWIDTH—DC to 1 GHz.

RISETIME—less than 0.35 ns.

DEFLECTION FACTOR— ≤ 10 V/cm.

INPUT IMPEDANCE— $125 \Omega \pm 2\%$.

HORIZONTAL

CALIBRATED TIME BASE—2 to 1000 ns/cm.

SWEEP DELAY—0 to 35 ns.

CRT

DISPLAY AREA—2 x 6 cm.

ACCELERATING VOLTAGE—24 kV.

PHOSPHOR—P11.

OTHER

CALIBRATION-STEP GENERATOR—0 to 10 V into 125Ω or 0 to 1 V into 50Ω , calibrated and continuously variable. (0.1 ns risetime, approx.) Approximately 750 Hz repetition rate.

POWER REQUIREMENTS—105 to 125 V or 210 to 250 V, approx 650 watts.

VERTICAL DEFLECTION

BANDWIDTH

DC to 1 GHz at 3-dB down.

RISETIME

Less than 0.35 ns.

DEFLECTION FACTOR

≤ 10 V/cm.

INPUT IMPEDANCE

$125\ \Omega \pm 2\%$.

MAXIMUM INPUT SIGNAL

± 15 VDC or 15 V RMS, or ± 100 -V pulse. Maximum power input is 1.8 watts.

SIGNAL DELAY

45 ns approx. Permits viewing of leading edge of triggering waveform.

HORIZONTAL DEFLECTION

TIME BASE

2 ns/cm to 1000 ns/cm in 9 calibrated steps (1-2-5 sequence), accurate within 3%.

SWEEP DELAY

Sweep start delayed 0—35 ns.

SINGLE SWEEP

After a single sweep is generated, the sweep circuit is locked out until the RESET button is pressed then sweep fires on next trigger. An external jack is provided for remote control of single sweep operation.

SYNCHROSCOPE OPERATION

The output signal from either the +TRIGGER 50 Ω , the DELAYED +GATE 50 Ω , or the +RATE 50 Ω connector can be used to control an external device.

RATE GENERATOR

Output pulse approx 15 V, risetime ≤ 0.8 ns, duration approx 10 ns. Repetition rate variable between 3 Hz and 30 kHz.

TRIGGER

MODES

Pulse—Permits choice of a free-running sweep or a stable sweep which can be triggered on random or uniform repetition rates up to approx 50 MHz.

Sync—Permits stable displays of signals occurring at a constant repetition rate to over 100 MHz.

HF Sync—Permits the sweep to be synchronized with signals from approx 100 MHz to over 1 GHz.

SOURCES

Internal, external, calibration-step generator, or rate generator.

REQUIREMENTS

Two trace widths vertical deflection and 1 ns or greater duration (Internal) or 20 mV or greater amplitude and 1 ns or greater duration (External). Sweep triggers on either the positive or negative slope of the triggering signal.

TRIGGER GAIN

Four gain settings of X0.2, NORMAL, X5, and X20 provide for attenuation or amplification of trigger signals.

MISCELLANEOUS

CALIBRATION STEP GENERATOR

A step-waveform of approximately 750 Hz repetition rate, with amplitude continuously variable and calibrated from 0 to 10 V into 125 Ω , or 0 to 1 V into 50 Ω (through a T50/T125 adapter) is available at a front-panel 125- Ω connector. Risetime is approximately 0.1 ns and either polarity can be selected. Continuously variable uncalibrated amplitudes of 0 to 50 V into 125 Ω are also available.

CATHODE-RAY TUBE

5 in round, flat-faced tube. 24 kV accelerating potential. Spot diameter at normal intensity 0.004 inch. Maximum x-ray radiation at a distance of two inches from the faceplate does not exceed 0.7 millirems per hour (human limit is 2.5 millirems per hour). At normal viewing distances, x-ray radiation is essentially zero. Normally supplied with P11 phosphor.

GRATICULE

Edge-lighted, 2 cm by 6 cm divisions. The horizontal center line markings are 5 mm apart and the vertical center line markings are 2 mm apart. Illumination is controlled by a front-panel knob. The graticule can be dropped out of view if desired.

CAMERA MOUNTING

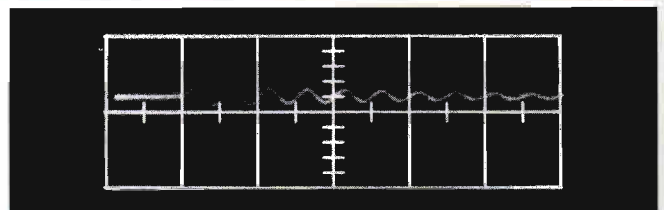
A special camera-mounting adapter with swing-away hinging easily accepts a Tektronix C-27-662R Camera. Please refer to the Camera Section for complete description.

POWER REQUIREMENTS

105 V to 125 V or 210 V to 250 V, 50 to 60 Hz, typically 650 watts. Factory wired for 105 V to 125 V. May be ordered wired for 210 V to 250 V operation.

SINGLE-SHOT PHOTOGRAPHY

A single-shot exposure using a Type C-27-662R Camera was used to take the picture at the right. The display shows a ≈ 1 GHz damped wave at 2 ns/cm. The waveform was enlarged 2 times to represent the actual size of the CRT display.



TYPE 519

DIMENSIONS AND WEIGHTS

| | | |
|--------------------------|---------------------|-----------------|
| Height | 22 $\frac{1}{4}$ in | 56.5 cm |
| Width | 14 $\frac{5}{8}$ in | 37.2 cm |
| Depth | 25 $\frac{1}{4}$ in | 64.1 cm |
| Net weight | 97 lb | 44.1 kg |
| Domestic shipping weight | \approx 130 lb | \approx 59 kg |
| Export-packed weight | \approx 169 lb | \approx 77 kg |

INCLUDED STANDARD ACCESSORIES

Viewing hood (016-0001-01); two 125 Ω terminations (017-0051-00); two 125 Ω insertion units (017-0013-00); 125 Ω coupling capacitor (017-0018-00); 125 Ω 1-GHz timing standard (017-0019-00); Double-button contact assembly (017-0032-00); Panel adapter assembly (017-0033-00); Cable connector (017-0035-00); 125 Ω min loss attenuator, T50/T125 (017-0052-00); 125 Ω adapter N50/N125 (017-0053-00); 125 Ω adapter, T50/N125 (017-0055-00); Delay-line equalizer (017-0057-00); 1-ns cable (017-0507-00); 2-ns cable (017-0508-00); 5-ns cable (017-0509-00); 10-ns cable (017-0510-00); 3 to 2-wire adapter (103-0013-00); Phone jack plug (134-0069-00); 3-conductor power cord (161-0010-03); Walnut box (202-0083-00); Two reed switches (260-0693-00); Accessory box tray (436-0030-00); Two instruction manuals (070-0243-00).

OPTIONAL ACCESSORIES

Optional accessories serve to extend the usefulness of the Type 519 in certain applications. This listing covers only the more commonly used items. The termination, cables, and adapters supplied with the instrument satisfy most measurement requirements. A complete list of accessory items can be found in the catalog accessory pages.

ATTENUATORS, ADAPTERS, AND CABLES

125- Ω 2:1 attenuator, order 017-0071-00
125- Ω 5:1 attenuator, order 017-0049-00
125- Ω 10:1 attenuator, order 017-0050-00
125- Ω adapter N50/T125, order 017-0054-00
125- Ω 90° elbow assembly, order 017-0043-00
125- Ω 20-ns cable, order 017-0511-00

SCOPE-MOBILE® CART

Provides portability between various operating areas and serves as a convenient working surface for Type 519, order Model 202-1, Mod 52

CAMERA

Ultra-high writing rate—f1.3, 1:0.5—Polaroid* Roll-Film back, order C-27-662R

*Registered Trade-Mark Polaroid Corporation

Please refer to Terms and Shipment, General Information page.