

5 mV to 5 V/div. sensitivity.  
1 ns/div. dual time base with mixed mode.  
XY operation.

#### CATHODAY RAY TUBE

##### Screen :

Rectangular, flat face 8 × 10 cm usable area, internal graticule scaled with 1 cm divisions, adjustable illumination.

**Phosphor :** P31 standard, P11 optional.

**Acceleration voltage :** 2 kV.

**Accelerating potential :** 18 kV.

**Writing speed :** 2 cm/ns.

##### External beam modulation :

Amplitude : 5 V.

Negative polarity.

Bandwidth : DC to 50 MHz.

Input impedance : > 5 kΩ.

Maximum admissible input voltage : ± 15 V.

#### VERTICAL DEFLECTION

Two identical amplifier channels.

**Bandwidth (– 3 dB) :** DC to 200 MHz.

##### Sensitivity :

5 mV/div. to 5 V/div. in 10 calibrated steps, 1-2-5 sequence, calibration accuracy : ± 3 %, both channels.

##### Digital readout of deflection factors :

- automatic display of true deflection factors with 10 : 1 probe
- using vernier indicated by flashing of units
- progressive setting of LED brightness
- suppression of LED corresponding to the not in use channel.

##### Continuous adjustment of gain :

Verniers with 2.5 : 1 ratio give step overlap.

3 channels : A, B + view trigger.  
B2 trigger independent from B1 digital readout of sensitivities and sweep rates.

##### Cascading of channels A and B :

(coupled by 50 Ω cable)

Input coupling : DC or AC (2 Hz - cut-off).

Bandwidth : DC to 90 MHz.

Deflection factors : from 1 mV/div.

##### Channel B vertical signal output :

Amplitude : 25 mV/div.

Impedance : 50 Ω.

Bandwidth (to – 3 dB) : DC to 100 MHz.

**Input coupling :** DC, 0, AC (2 Hz cut-off).

##### Input impedance :

without probe : 1 MΩ/ / about 20 pF

with probe : 10 MΩ/ / 11 pF.

##### Maximum admissible input voltage :

Without probe : 250 V DC,

500 V peak to peak AC.

With probe : 750 V DC or peak to peak AC.

**Delay line :** visible delay : about 40 ns.

**Indicators :** the direction in which the spot has gone off the screen is shown by lamps.

##### Vertical display modes :

Channel A only, channel B only ; channels A and ± B chopped or alternate ; channels A ± B ; channels A and ± B and A ± B chopped or alternate ; with these 3 latter positions, it's possible to display the trigger signal. Channel B polarity can be inverted.

##### Trigger modes :

The trigger signal can be picked off channel A or channel B, and off A and B alternately in « ALT » mode.

The channel A and B signals and the external trigger signal can be viewed simultaneously.

optional,  
5380 multimeter 2000 scale  
direct reading of current, voltage,  
resistance, time and frequency, etc.

#### HORIZONTAL DEFLECTION

##### Time bases :

Main B1, delayed B2, B1 and B2 mixed.

##### Sweep rates :

B1 : 10 ns/div. to 0.5 s/div.

in 24 calibrated steps

B2 : 10 ns/div. to 50 ns/div.

in 23 calibrated steps

1-2-5 sequence ; ± 10 expander extends sweep rate to 1 ns/div. ; continuous adjustment of B1 sweep rate with 2.5 : 1 ratio gives step overlap.

##### Digital readout of × 1 × 10 sweep rates :

Using vernier indicated by flashing of units.

##### Calibration accuracy, B1 and B2 :

± 2 % from 0.1 μs/div. to 50 ms/div.

± 3 % from 10 ns/div. to 50 ns/div.

± 3 % from 0.1 s/div. to 0.5 s/div.

× expander ± 2 %.

##### Horizontal display modes :

B1 only, B1 delaying and intensified by B2 ;

B2 only delayed by B1, B1 and B2 mixed.

##### Delay system :

Delay : 0.5 s to 0.1 μs/div. ; ± 2 % of B1.

Jitter : 1/20 000th of total duration of B1.

#### TRIGGERING

##### Source :

• internal, from signal picked off channel A or B, or off A and B alternately in « ALT » vertical display mode.

In internal trigger mode, B2 sweep can be triggered either by the same signal as B1, or else independently from channel B.

## 5218 compact oscilloscope

### 200 MHz - 3 channels

- line (power line frequency), for B1 only
- external
- external 1/10 ( $\times 10$  attenuator) in external, input impedance : 1 M $\Omega$ /about 20 pF. input voltage, min. : 100 mV, max. : 200 V DC + peak AC, 500 V peak to peak AC.

#### Coupling :

DC (=) B1 - B2

signal directly coupled to amplifier

triggering from DC to 200 MHz

AC ( $\sim$ ) B1 - B2

triggering from 10 Hz to 200 MHz

$\sqrt{\sim}$  (B1),

low frequencies are blocked

triggering from 10 kHz to 200 MHz

$\sim$  (B1),

high frequencies are blocked

triggering from DC to 10 kHz.

**Polarity :** triggering from positive or negative going signal edge.

#### Modes :

##### B1 time base

Automatic,

adjustable trigger level, any input signal of frequency between 30 Hz and 200 MHz, sweep runs in absence of trigger signal. normal,

sweep runs when triggered, signal frequency DC to 100 MHz.

##### B2 time base

Starts after delay B2 starts after delay set with 10-turn delay control.

Retriggered, triggerable from DC to 100 MHz.

B2 sweep starts on first trigger event to occur after delay time set with 10-turn delay

control has expired.

#### Single sweep :

Available with all trigger modes.

**B1 hold-off :** adjustable, permits stable display of complex repetitive waveforms and digital data words.

**Indicator :** a lamp lights when B1 time base is triggered.

#### Trigger view :

The external trigger signal can be displayed continuously at the same time as the channel A and B signals (third channel).

#### XY OPERATION

Channel A is used for vertical deflection, and channel B for horizontal deflection.

#### Phase error between channels :

less than 3° at 1 MHz.

Y channel : identical to channel A

X channel : bandwidth : DC to 1 MHz

Sensitivity : 5 mV/div. to 5 V/div.  $\pm 5\%$ .

Input impedance : 1 M $\Omega$ /about 20 pF.

Maximum input voltage :

250 V DC + peak AC ; 500 V p-p AC.

#### OPTION

**Multimeter type 5380**

#### GENERAL CHARACTERISTICS

**Calibrator :** voltage and current outputs

Square wave

Amplitude : 600 mV - 20 mA  $\pm 3\%$

Frequency : about 1 kHz.

#### Auxiliary outputs :

B1 and B2 bright-up pulses

Amplitude (TTL) :

low : + 0.4 V - high : + 5 V.

Output impedance : about 500  $\Omega$ .

**Dimensions in mm (in) :** see, page 26.

**Weight :** 12.3 kg (27.12 lb).

#### Active probe power :

Two jacks LEMO, RAOM4, supply + 15 V, + 5 V, - 15 V for powering active probes.

#### Power requirements :

AC mains : 115, 127, 200, 220, 240 V

$\pm 10\%$  at 50 Hz,  $\pm 5\%$  at 400 Hz.

Frequency : 48 to 420 Hz.

Consumption about 160 VA.

#### Temperature ranges :

Operating : 0° C to + 50° C

Performance guaranteed : + 10° C to + 40° C

Storage : - 20° C to + 70° C

**Humidity :** 85 % RH for 10 days at + 40° C.

**Vibration :**  $\pm 1$  mm, 0 to 23 Hz,

15 minutes on each of 3 axes.

#### ACCESSORIES

##### Supplied with the instrument :

Technical manual ; two 1/10 passive probes ; viewing hood, model PS 2303 ; protective cover, model 53204 ;

power input lead, P/N 8315 000 81.

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##### Optional :

Oscillophot cameras (see, page 48)

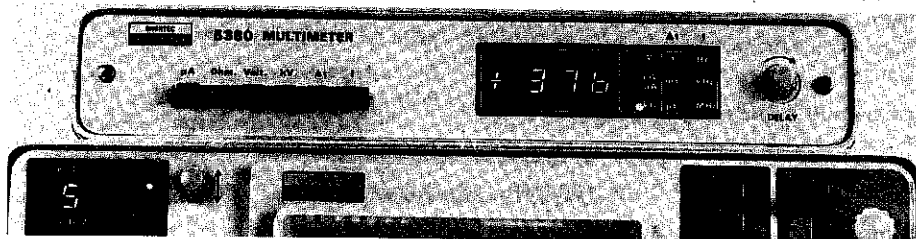
Accessory wallet 53208 ;

Viewing hood, model PS 2304.

#### RACK MOUNTING

Possible, through a 4-unit high adapter chassis, ref. : 53300 (see, page 26).

### option 5380 multimeter 2000 scale



With the 5380 multimeter, time intervals can be read directly from the 3 1/2 digit LED screen. Simply use the delay time control and the  $\Delta$  time dial to position intensified spots at the beginning and end of the interval you wish to measure.

The 5380 enables frequency or 1/T measurements.

#### DC VOLTAGE

##### Automatic ranges :

from 200 mV to 200 V full scale.

**Maximum resolution :** 100  $\mu$ V

Automatic positive or negative polarity.

**Accuracy :**  $\pm 0.5\%$   $\pm 1$  digit full scale on 200 mV, 2 V, 200 V ranges  
 $\pm 2\%$   $\pm 1$  digit full scale on 2 kV range.

##### Floating inputs :

Maximum voltage and insulation  
500 V DC or pp AC.

**2 kV inputs ( $\pm 2\%$ ) :**

Maximum voltage and insulation 3 kV.

##### Input impedance :

1 000 M $\Omega$  at about 200 mV  
 $\geq 10$  M $\Omega$  at 2 V, 20 V, 200 V  
 $\geq 100$  M $\Omega$  at 2 kV.

##### Rejection ratio :

Common-mode 100 dB at DC  
80 dB at 50 Hz.

#### CURRENT

**One range :** sensitivity 200  $\mu$ A.

**Resolution :** 0.1  $\mu$ A.

**Input impedance :** 1 k $\Omega$   $\pm 2\%$ .

**Accuracy :**  $\pm 1\%$   $\pm 1$  digit full scale external shunts enable to extend the range.

#### DIFFERENTIAL TIME MEASUREMENTS

**$\Delta$  time :** max. 5 s - min. 0.1  $\mu$ s.

**Accuracy :** add  $\pm 0.5\%$  or 1 digit to B1 time base accuracy of oscilloscope.

#### FREQUENCY MEASUREMENTS OR 1/T time

**Accuracy :** add  $\pm 2\%$   $\pm 1$  digit to time measurement ( $\Delta T$ ) accuracy.

#### RESISTANCE

from 2 k $\Omega$  to 2 M $\Omega$  full scale.

**Resolution :** 1  $\Omega$ .

**Accuracy :**  $\pm 0.5\%$   $\pm 1$  digit full scale from 1 k $\Omega$  to 200 k $\Omega$ .

$\pm 1\%$   $\pm 1$  digit full scale on 2 M $\Omega$  range.

**Maximum safe input voltage :**

200 V DC or pp AC.

#### GENERAL CHARACTERISTICS

##### Temperature ranges :

Operating 0° to + 50° C

Performance guaranteed : + 10° C to + 40° C

Storage : - 20° C to + 70° C.

##### Dimensions in mm (in) :

Height : 45 (1.77) - Width : 250 (9.8)

Depth : 212 (8.3).

**Weight :** 2 kg (4.4 lb).

#### RACK MOUNTING

Associated with 5216 or 5218 oscilloscopes, the 5380 can be rack mounted through an adapter chassis, ref. : 53307.