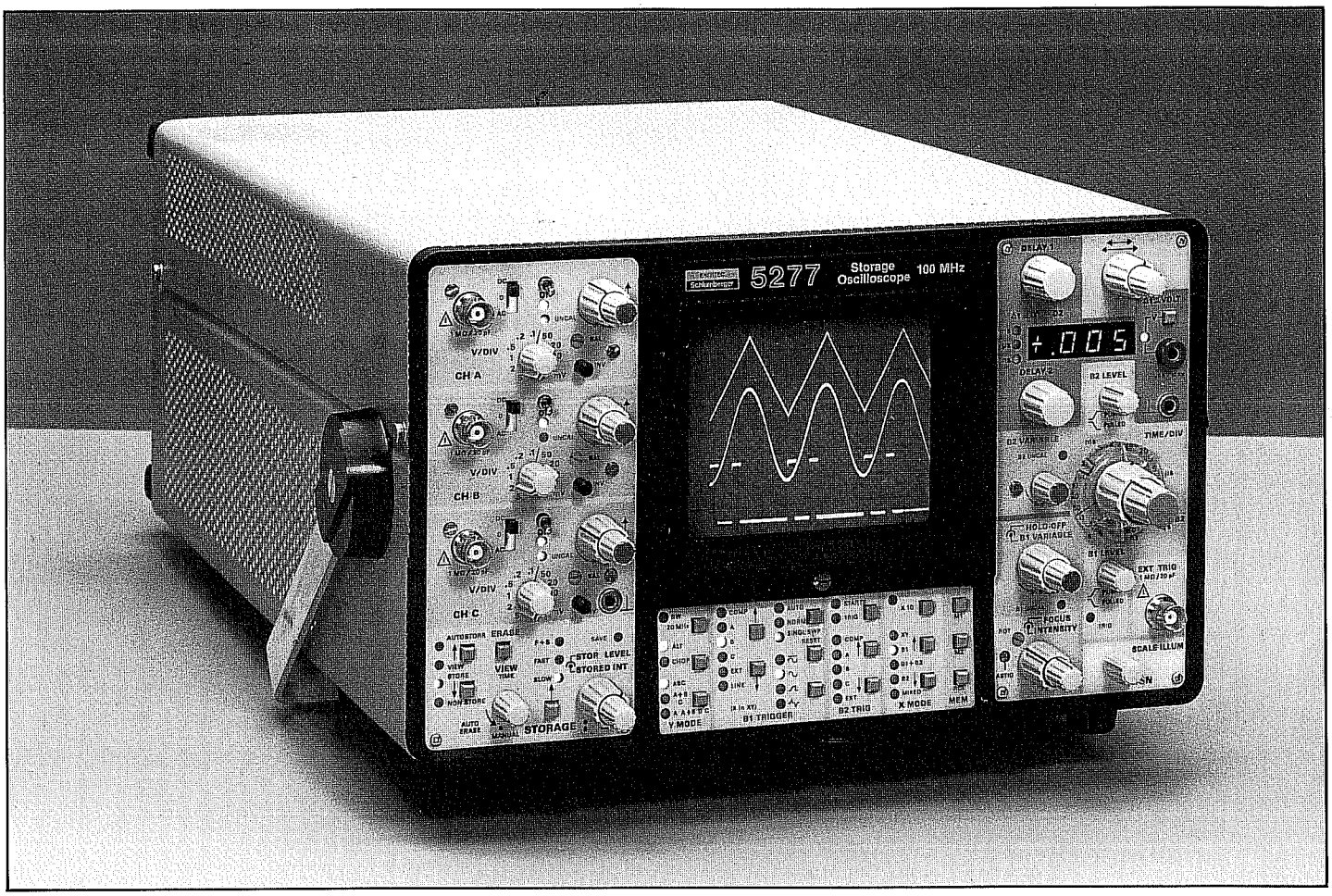
STORAGE OSCILLOSCOPE 5277 100MHz



3 channels,
Storage or conventional

2000 div/µs writing speed
Built-in multimeter

Function control keyboard
Set-up configuration storage

CATHODE RAY TUBE

Transfer type memory tube ; uses two variable persistance targets.
Phosphor : P31.
Screen : rectangular flat, useful area 8 × 10 div. of 0.9 cm. Graticule printed on the CRT with variable illumination.
Post acceleration voltage : 10kV.

OPERATING MODES

Conventional.
Recording (store).
Display : duration controlled by potentiometer.
Auto-storage (autostore) : transient recorder in all three modes.
Variable persistance in rapid and slow modes.
Transfer : manual or automatic erase (2Hz min.).
Tube self protecting against burns.
External Z modulation :
Beam spot suppresion by + 5V voltage, approximately.
Bandwidth : 0 - 20MHz.
Input impedance : 2kΩ.

RECORDING

Recording speed (div./µs) / Retention time	1	10	100	300	2000
Mode 1 rapid transfer	10 min	10 min	3 min	15 s	10 s
Mode 2 rapid, variable persistance	Mode 3	preferable	5 s	5 s	1 s
Mode 3 slow, variable persistance	30 s	10 s			

Maximum permissible voltage : 50VPP.

VERTICAL DEFLECTION

3 channels A, B and C.

Bandwidth : (− 3dB) ; 0 to 100MHz. Filter 20MHz.

Sensitivity : Channels A, B and C.
5mV/div. to 5V/div. up to 100MHz.
2mV/div. up to 50MHz.
Adjustable by attenuator with 11-position in 1 - 2 - 5 sequence.
Calibration accuracy : ± 3 %.
Fine adjustment of gain by 2.5 : 1 ratio vernier with switch and indicator light.

Input coupling : DC, 0, AC (2Hz).

Input impedance :
Without probe : 1MΩ//20pF approximately.
With probe : 10MΩ//12pF.

Maximum permissible input voltage :
Without probe : 350V DC + P-AC ; 700V PP-AC.
With probe : 600V DC or PP-AC.

Delay line : Visible delay, about 20ns.

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Vertical display modes :
Channels A, B, C.
Channels ± A ± B and C,
Channels A, A ± B, B, C (4 traces).
Inversing of polarity on the 3 channels.
Channels A, B and C may be used separately or simultaneously in alternate or switched mode to a fixed frequency of approximately 1MHz.
An indicator light shows which channels are in use.
Each channel may be inhibited by a switch (indicator light out) ; this makes it possible to display 1, 2, 3 or 4 traces.
Triggering sources are not affected by display selection.

HORIZONTAL DEFLECTION

Time base : main B1, delayed B2, B1 and B2 mixed.
Sweep rates :
B1 : 50ns/div. to 0.5 s/div.
in 22 positions.
B2 : 50ns/div. to 50ms/div.
in 19 positions.
Sequence : 1 − 2 − 5.
Expansion : × 10 leading to a sweep time of 5ns/div.
Fine adjustment of B1 and B2 by two 2.5 ratio verniers making it possible to cover ranges with switches and indicator lights.
B1 and B2 calibration accuracy :
± 3 % on all ranges.
Expansion : × 10 : ± 2 %.
Horizontal display modes :
B1 only ; B1 delayed B2, B2 highlighted ; B2 only, delayed by B1 ; B1 and B2 mixed.
Delay system :
Two 10-turn control R1 and R2 release B2 at any two points along B1.
Delay R1 initializes B2 or enables B2 trigger. Delay time : 0.5s/div. to 0.1µs/div. + 2 % of B1.
Jitter : 1/20 000th of B1 duration.

TRIGGERING

B1
Source :
• Internal : from samples taken from channels A, B, C or from the composite signal of channels A, B, C.
Sensitivity ⩽ 0.5 div. at 1kHz.
⩽1.5 div. at 100MHz.
• Line : equipment power supply.
• External :
Sensitivity ⩽ 100mV at 1kHz.
⩽ 200mV at 10MHz.
• External 1/10 : attenuation by 10.
Sensitivity ⩽ 1V at 1kHz.
⩽ 2V at 100MHz.
Input impedance : 1MΩ//20pF.
Maximum permissible voltage :
350V DC + P-AC.
Coupling : DC, AC, integrated, differentiated.
Polarity : positive or negative.

Modes :
Automatic with adjustable level : sweep runs even without input signal.
Normal with adjustable level : sweep waits for signal to start.
Single shot : with reset indicator light. An indicator light signals the triggering of B1.
Hold-off control :
Adjustable, enables the triggering of complex phenomena and data processing words.
B2
Source :
• Internal : from samples taken from channels A, B, C or on the composite signals of A, B, C.
• External.
Coupling : DC, 0, AC (2Hz).
Polarity : positive or negative.
Mode :
Free running : outgoing signal from B2 occurs after the delay imposed by the 10-turn potentiometers R1-R2.
Triggered with level : outgoing signal from B2 is caused by the first signal imposed by the 10-turn potentiometer R1.

XY OPERATION

Vertical deflection is selected by " MODE Y ".
Horizontal deflection is by
" Synchro B1 "
Bandwidth : 0 to 2MHz.
Accuracy in X : ± 5 %.
Phase error : ⩽ 1° to 1MHz.

DC VOLTAGE MEASUREMENT

Measurement relative to the oscilloscope ground.
LED DISPLAY, 7 segments with decimal point.
Automatic polarity.
Units and Volts shown by indicator light.
Sensitivity : 3 ranges, switched automatically : 19.99V. 199.9V. 1999V full scale.
Minimum resolution : 10mV.
Accuracy : ± (1 % full scale ± 1 digit).
Input impedance :
10MΩ approx.//⩽ 10pF.
Maximum permissible voltage :
1.5kV DC, 3kV PP-AC.

TIME MEASUREMENT

Uses B2 sweep in free mode via R1 and R2. Measurement can be made by positioning the two intensified portions in B1 + B2 mode or by superimposing the traces in B2 mode.
Display by 7-segment LEDs with decimal point.
Units : ms, µs or ns, shown by indicator lights.
Automatic polarity.
Sensitivity : 1999ns to 1999ms, full scale with automatic switching of ranges in accordance with the position of the " div. B1 duration " switch.
Minimum resolution : 0.1ns.
Accuracy : ± (1 % full scale + 1 digit) to be added to the accuracy of B1.

AUXILIARY OUTPUTS

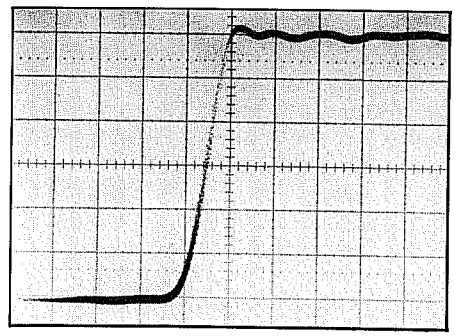
• Positive rectangular output signal for probe adjustment.
Amplitude : 0.5V ± 3 %.
Frequency : 1kHz approx.
• B1, B2 pulse output.
ECL level − 0.8V to + 1.8V.

GENERAL

This oscilloscope complies with safety standard NF 20030 and IEC 348 class 1.
Power supply :
Line supply : 127V. 220V. 240V.
± 10 % at 48Hz, ± 5 % at 400Hz.
Frequency : 48Hz to 440Hz.
Consumption : 100VA approx.
Temperature ranges :
Operating : 0 to + 50°C.
Guaranteed performance :
+ 10°C to + 40°C.
Storage : − 20°C to + 70°C.
Humidity : 85 % for 10 days at + 40°C.
Dimensions in mm (in) :
H. : 172 (6.77) ; W. : 335 (13.18) ;
D. : 440 (17.32).
Weight : 12.8 kg (28.2lb).

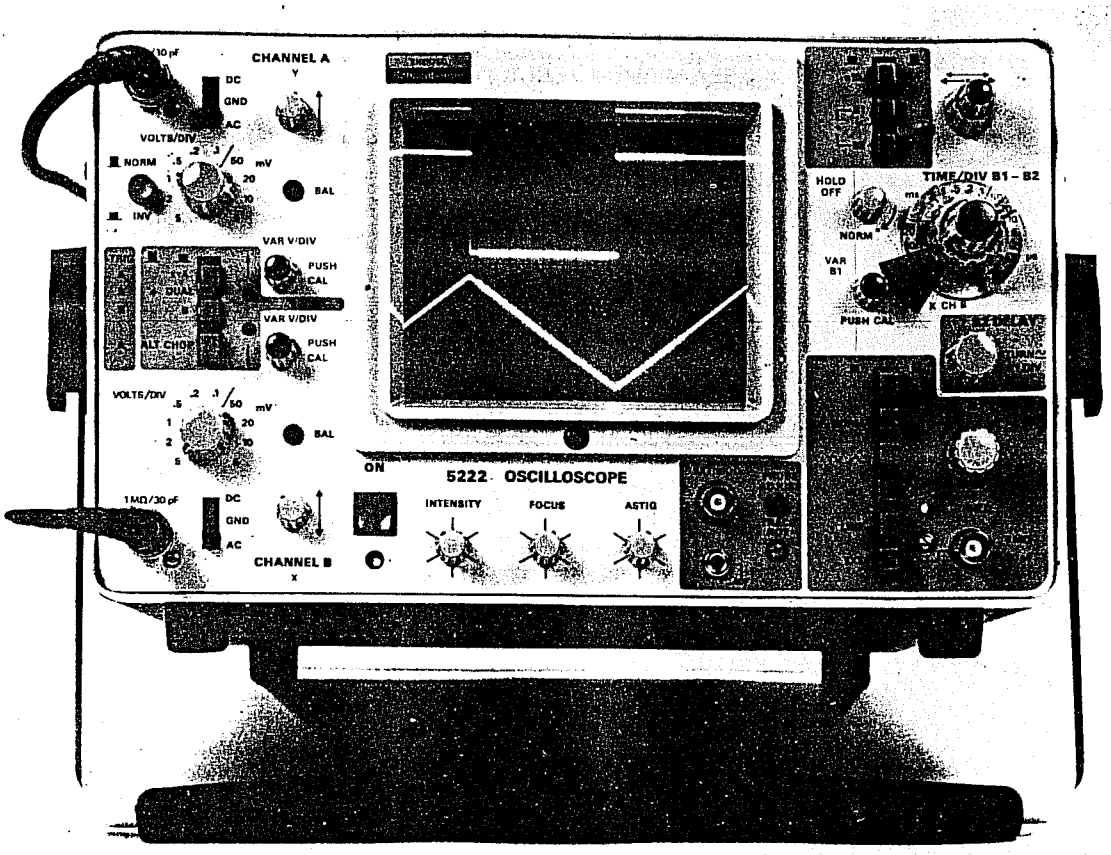
ACCESSORIES

Supplied with the instrument :
1 technical manual,
3 passive probes, 1/10,
1 viewing hood PS 2303,
1 protective cover, 53210.
Optional :
Accessories bag, 53203.
Viewing hood PS 2304,
Rack mounting 4U, 53311.



Single shot 5ns/div. sweep rates F + S mode.

5222 compact oscilloscope
50 MHz - 2 channels



10 ns/div. dual time base
High brightness 8 × 10 cm CRT
5 mV to 5 V/div. sensitivity

Low jitter : 1/50 000
normal or TV triggering
Trigger lamp

Adjustable hold-off
XY mode : 3° at 1 MHz

CATHODE RAY TUBE

Screen : rectangular, flat face, usable screen area 8 × 10 div. with 1 div. = 1 cm, internal graticule.

Phosphor : P2 standard.

Accelerating potential : 10 kV.

External beam modulation :
Spot blanked by positive voltage.
Amplitude : 5 V, input impedance : 1 kΩ.
Bandwidth : DC to about 20 MHz.
Maximum admissible input voltage :
25 V DC + AC peak.

VERTICAL DEFLECTION

Two amplifier channels, A and B.

Bandwidth : DC to 50 MHz.

Sensitivity : 5 mV/div. to 5 V/div. in 10 calibrated steps : 1-2-5 sequence ; calibration accuracy : ± 3 % ; continuous gain adjustment between steps by 2.5 : 1 vernier.

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

Input impedance :
without probe : 1 MΩ//30 pF
with probe : 10 MΩ//12 pF.

Maximum admissible input voltage :
without probe :
350 V DC + peak AC ;
700 V peak to peak AC.
with probe :
750 V DC or p-p AC

Delay line :
Visible delay : about 30 ns.

Vertical display modes :
Channel A only ; channel B only ; channels A and B alternated or chooped at about 200 kHz ; algebraic sum of channels ± A, B ; channel A polarity may by inverted.

Trigger modes :
The trigger signal is picked off :
channel A in A display mode ;
channel B in B display mode ;
channel A in A and B display modes.

Indicators : lamps show the direction in which the spot has gone off screen.

HORIZONTAL DEFLECTION

Dual time base, B1 and B2

Sweep rates :
B1 : 100 ns/div. to 0.5 s/div.
in 21 calibrated steps.
B2 : 100 ns/div. to 50 ms/div.
in 18 calibrated steps.

Sequence : 1-2-5 ; expander increases maximum sweep rate by factor of 10 to 10 ns/div. ; continuous variation of B1 rate between steps with 2.5 : 1 vernier.

Calibration accuracy :
B1 - B2 : ± 3 % ; × 10 expander : ± 2 %.

Horizontal display modes :
B1 only ; B1 delaying and brightened by B2 ; B2 only, delayed by B1.

Delay system : a 10-turn control adjusts the point on B1 sweep at which B2 starts.

TRIGGERING

B1

Source : internal, line, external.
External : input impedance : 1 MΩ//3
input voltage : min. 300 mV at 1 kH
max. 350 V DC + pe

Polarity : positive, negative.

Coupling :
2 positions : normal or TV (filtered) ;
frames for sweep rates ≥ 0.1 ms/di
lines for sweep rates < 0.1 ms/div.

Modes : automatic or normal, with
ble trigger level.
A lamp lights when B1 is triggered.

B2 :
Free running, starts after selected d
Jitter : ≤ 1/50 000th of total durati

Hold-off : adjustable for B1.

XY OPERATION

Channel A is used for vertical d
channel B for horizontal deflection.

Sensitivity : 5 mV/div. to 5 V/div.

Bandwidth : DC to about 1 MHz.

Input impedance : 1 M Ω//30 pF.

Maximum input voltage : 350
peak AC or 700 V peak to peak A

Phase error : ≤ 1° at 50 Hz, ±
1 MHz.

222 compact oscilloscope - 50 MHz - 2 channels

NERAL CHARACTERISTICS

iliary output : positive rectangular wave
probe adjustment.
plitude : 0.5 V ± 5 %.
quency : about 1 kHz.
put impedance : 500 Ω.

ver requirements :
mains, 127 or 220 V ± 10 %.
quency : 48 to 63 Hz.
er consumption : about 60 VA.

ensions : see page 47.

Weight : about 8.8 kg (19.4 lb).

Temperature ranges :

Operating : 0 to + 50° C.
Performance guaranteed : + 10° C to + 40° C.
Storage : — 20° C to + 70° C.

Humidity : 80 % RH for 10 days at + 40° C.

ACCESSORIES

Supplied with the instrument :
technical manual ;
viewing hood PS 2303 ;
mains power cable 8315 00081 ;
two passive 1/10 probes ;
protective cover, model 53204.

Optional :

Accessory bag 53203 ; viewing hood model PS 2304 ; oscillophot cameras (see, page 62).

RACK MOUNTING

Possible, through a 4-unit high adapter chassis, ref. : 53305 (see, page 47).

273 storage oscilloscope - 75 MHz - 2 channels