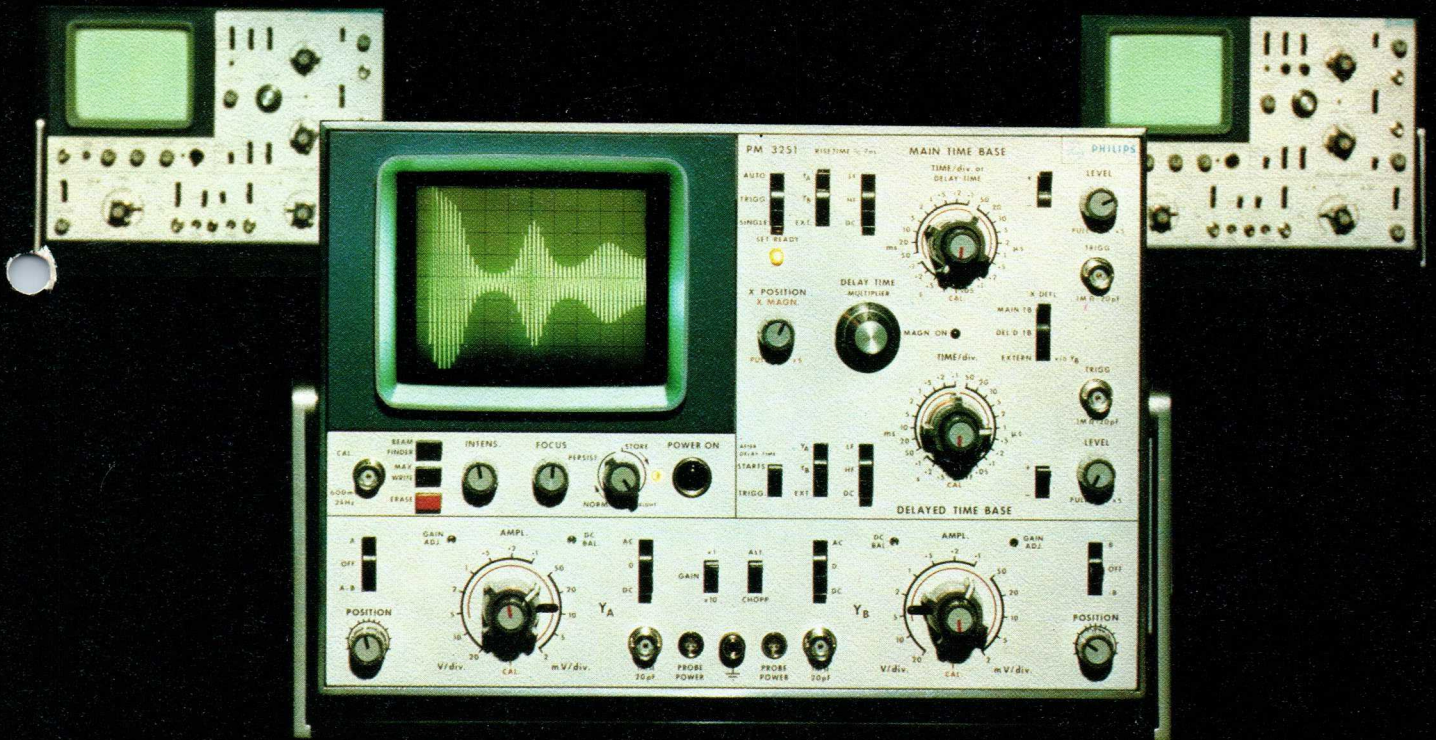




# PHILIPS

## EVERYTHING YOU NEED AT 50 MHz



# A standard, a storage and a special TV oscilloscope provide everything you need for accurate measurements to well over 50 MHz

The Philips 50 MHz oscilloscope range comprises three models. The PM 3250 that introduced 2 mV sensitivity at 50 MHz (200  $\mu$ V at 5 MHz); the new variable persistence and variable storage 'scope PM 3251 and the special model PM 3250X for TV broadcasting and manufacturing applications.

## All instruments share these seven special features:

**Sensitivity:** an unequalled 2 mV at 50 MHz and 200  $\mu$ V at 5 MHz.

**Negligible DC drift:** high sensitivities are virtually meaningless unless drift is made negligible. A unique Philips circuit does just that.

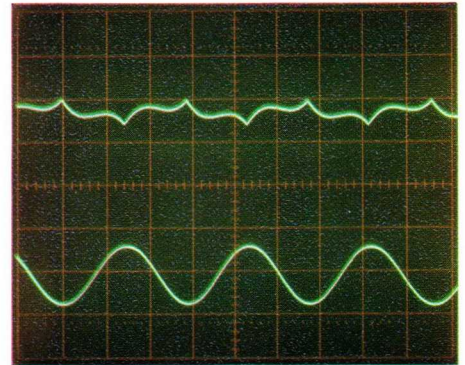
**Large dynamic range:** the standard dynamic range is 24 divisions (3 screens) in the high sensitivity position this is increased to 200 undistorted divisions (25 screens) on all attenuator positions.

**Trouble free triggering:** a simple but effective triggering arrangement eliminates the possibility of phase error in the alternate mode. Triggering is also stable in the DC coupled mode when adjusting gain and position.

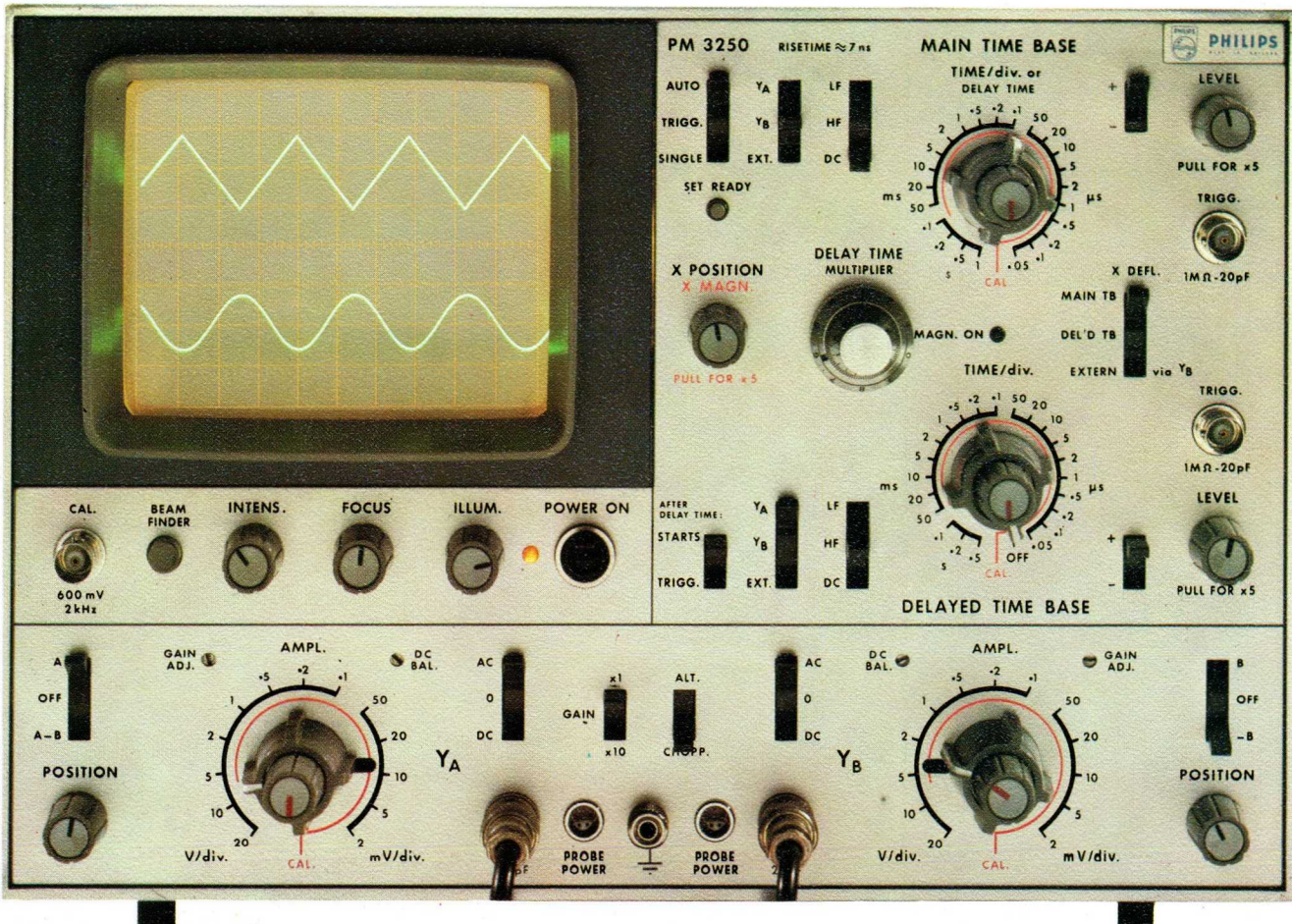
**High chopper frequency:** the 1 MHz chopper ensures good definition at high time base speeds. This is essential for comparing two signals in the single shot mode

**Differential measurements:** we let you see the differential signal A-B at the same time as the original signal on channel B. (See oscillogram).

**Simple controls:** last but not least is the very high standard of ergonomic design. Get your hands on one of our instruments and you'll appreciate the trouble we take over this feature.



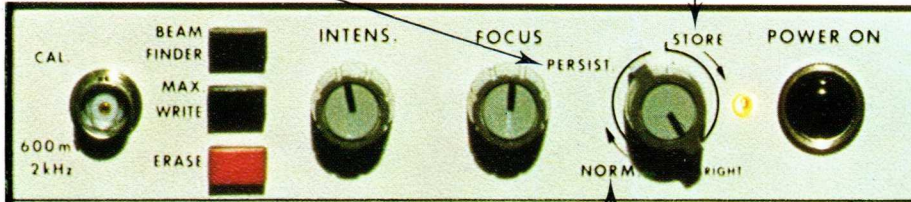
The illustration below shows two signals on the A and B channels. The oscillogram above shows how the differential signal A-B can be displayed together with the original signal on channel B.



**The three-in-one storage oscilloscope PM 3251**

Turn clockwise and you have variable persistence from 0.3 s to 10 minutes. (With no reduction in basic specifications). Variable persistence is ideal for difficult-to-see signals like low frequency signals with flicker, also high frequency, fast rise time pulses with low repetition rates.

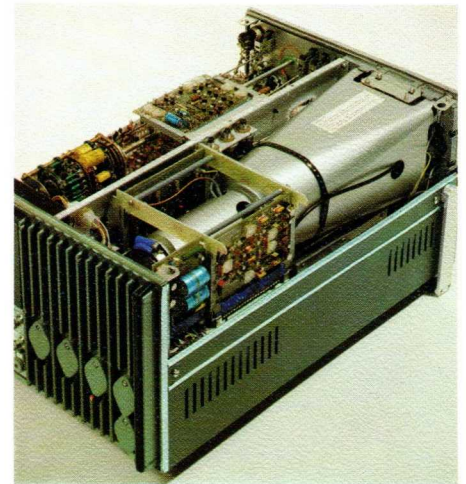
Switch round and you have a storage 'scope' with continuous control of the 'brightness x storage time' constant. (2 hrs at min. brightness to 10 mins at max. brightness).



"Max write" control for fast single shot signals.

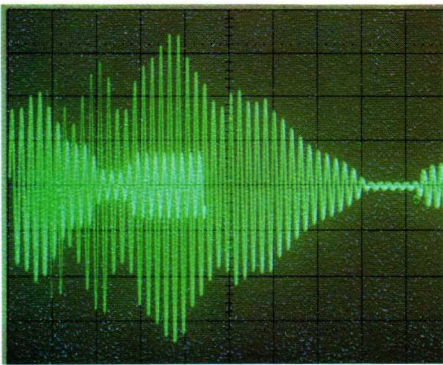
Signal erasure in around 500 ms.

Switch to normal and you have a "conventional" 50 MHz instrument with an unconventional 2 mV sensitivity (200  $\mu$ V at 5 MHz).

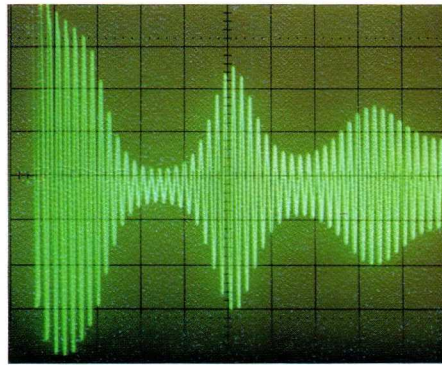


This is the new generation half-tone tube that allowed us to improve and simplify storage. It's about the same size as a conventional c.r.t. and does not suffer from aging effects. Neither is it over-sensitive to high intensity signals. (More details overleaf).

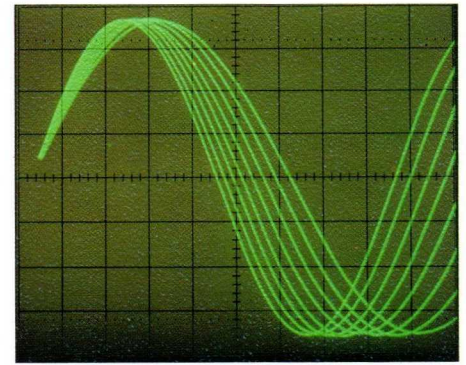
**Varied signals demonstrate storage versatility**



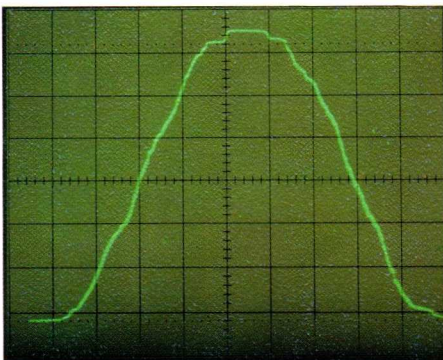
Example of how variable persistence can be set so that old trace fades away just as the new one is written.



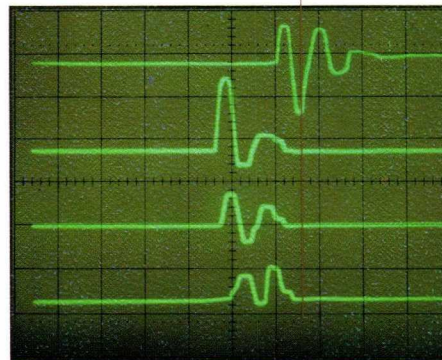
This oscillogram shows how variable persistence can be used to show slow moving, low frequency phenomena.



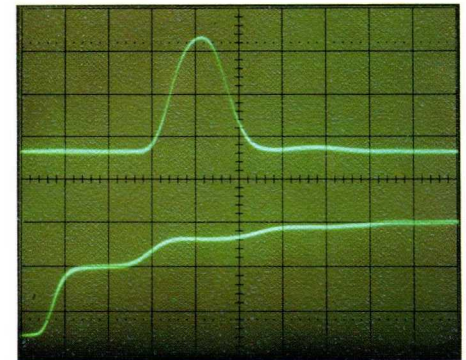
In this example long persistence is used to illustrate variations in the signal.



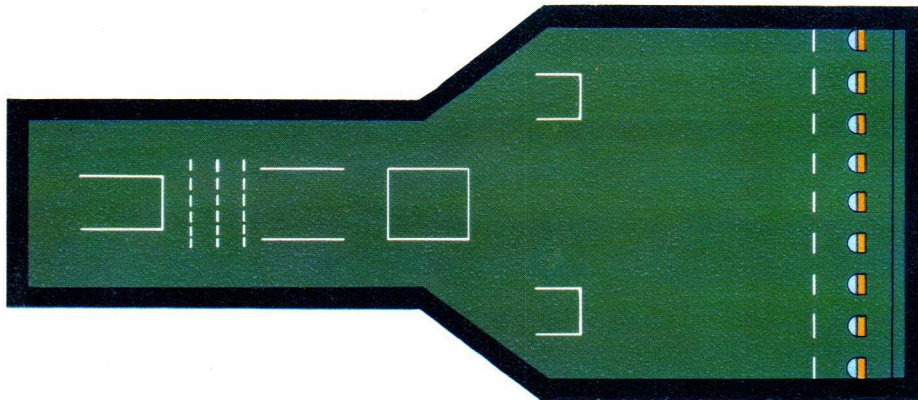
This oscillogram demonstrates the use of storage to hold and display the signal from a transducer.



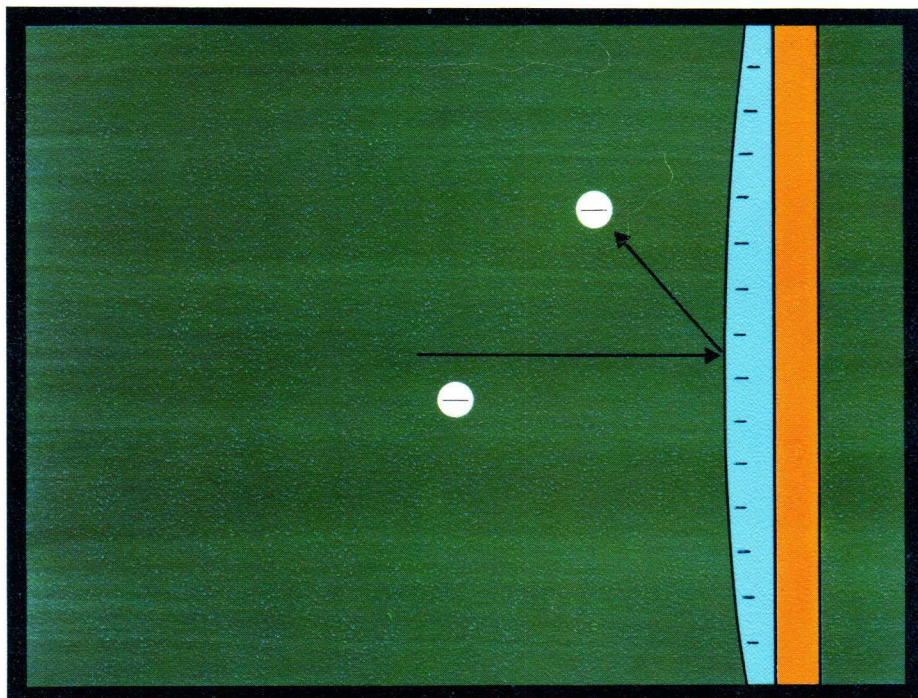
Example of how signals can be stored in turn and then displayed. In this way the relationship of different single-shot events can be evaluated.



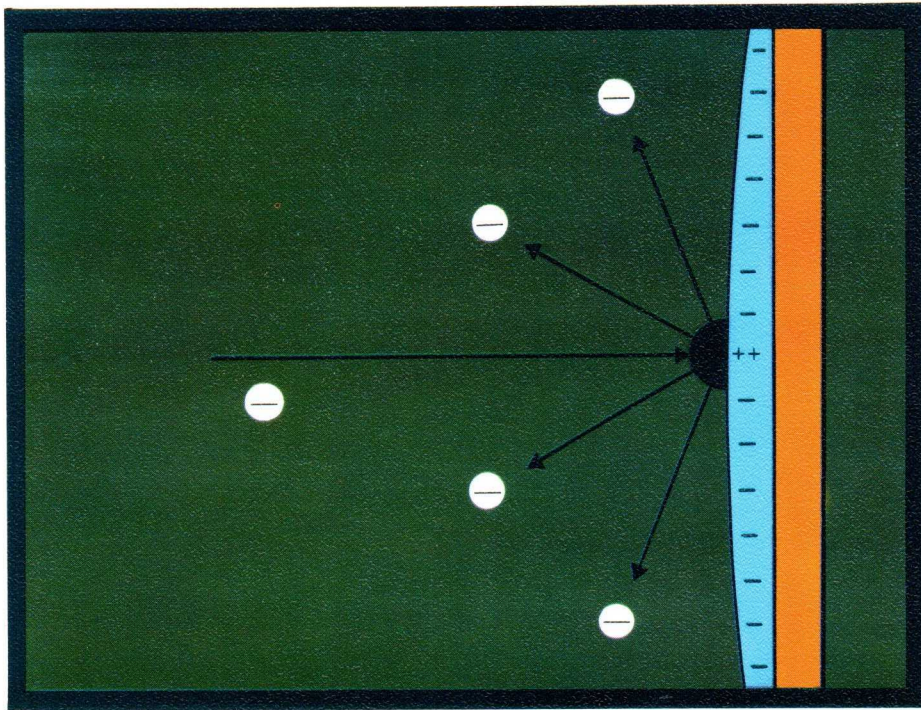
Only with a half-tone storage oscilloscope can such fast, low repetition rate pulses be displayed with full brightness (time base setting at 10 ns/div; repetition frequency 10 Hz).



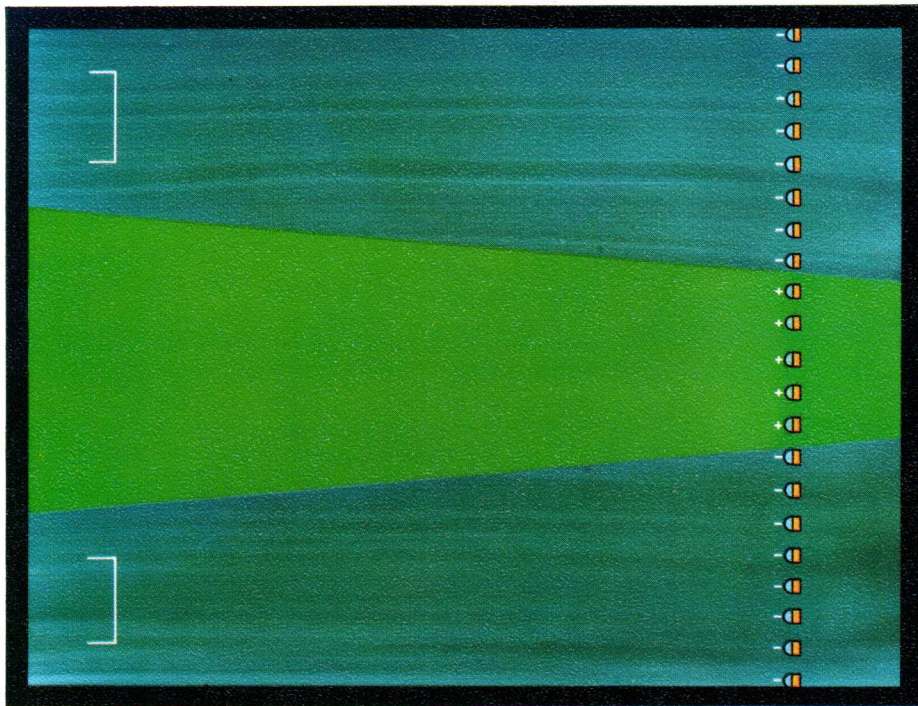
A schematic diagram of the new generation half-tone tube. Major advantages of this tube are the large 8 x 10 div screen, the excellent luminance due to the 6 kV post deflection acceleration and the fine spot quality.



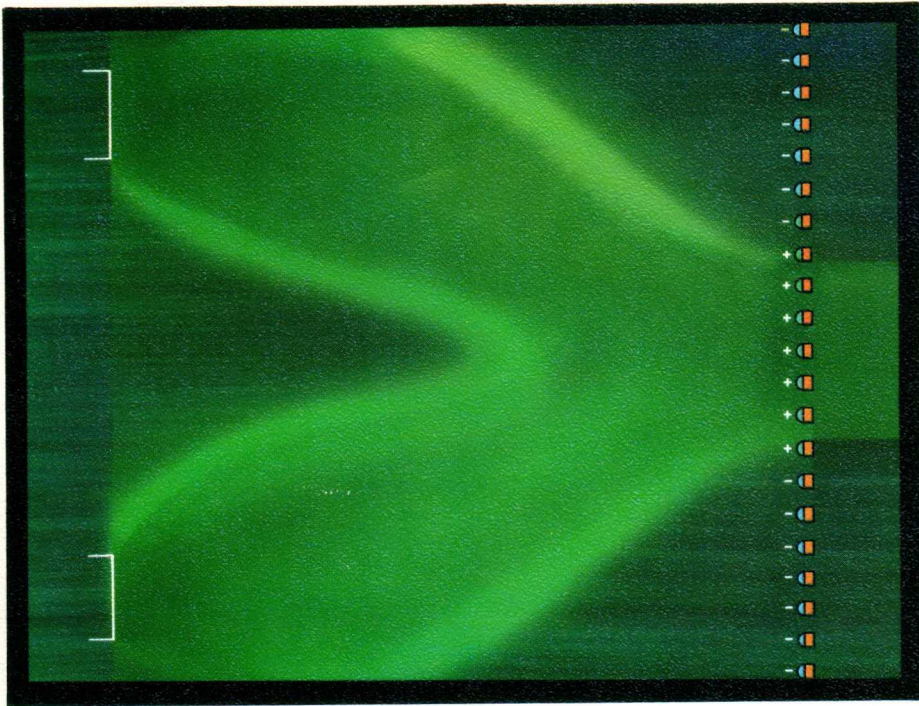
These four diagrams illustrate the basic principles of storage. This detail view of one element of the storage mesh shows that a slow-moving electron does not change the applied negative charge.



*A fast-moving electron, however, causes secondary emission and that particular grid element changes to a positive charge.*



*We now see the effect of a single-shot electron beam on the total storage mesh. Those sections in the path of the beam change to a positive charge.*

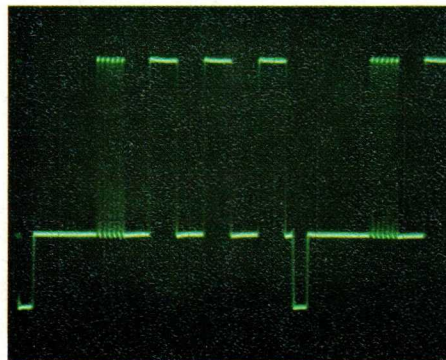
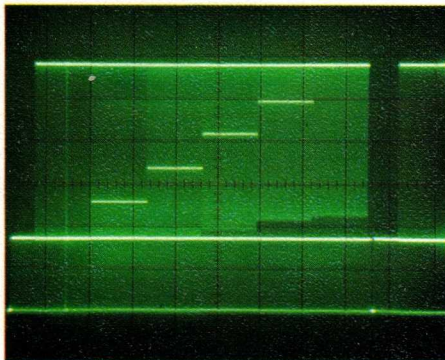
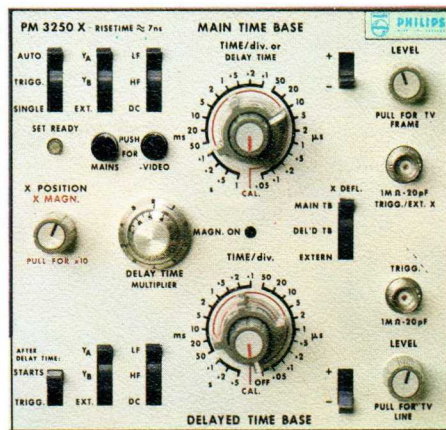


After the single shot phenomena the positive charge is retained and therefore the beam of the flood guns passes through the storage mesh and reproduces the original information on the screen.

#### TV model PM 3250X

For TV broadcast and manufacturing applications a special model has been developed. This instrument allows TV signals to be displayed easily and accurately, as shown below.

The user introduces the special TV features by pulling the knob marked "TV frame". He can then, for example, select any one TV line by using the delay time multiplier. Switching to delay and operating "pull for line" then gives a detailed accurate display as shown in the oscillogram. If more detail is required it is easily obtained by switching to the "X10" vertical sensitivity position and/or the "X10" horizontal magnifier.



#### PM 3250 Oscilloscope Family

Main Specification Summary:

#### Y-AXIS

**Bandwidth:** 0 to 50 MHz  
2mV maximum sensitivity  
0 to 5MHz  
200 $\mu$ V maximum sensitivity

Typical 60 MHz at 10 mV sensitivity

**Input impedance** 1 M $\Omega$ /20pF  
**Positioning range:** 24 divisions at full bandwidth 160 divisions in X10

**Maximum drift:** 0.3 div/min  
1.0 div/week

#### X-AXIS

**Main Time Base:** 1 s/div - 50 ns/div  
**Modes:** Auto - Triggered - Single  
**Delayed Time Base:** 0.5 s/div - 50 ns/div  
**Modes:** Directly starting triggered by Main TB or Triggered after delay interval by signal

**Time bases:** Channel A, channel B or External  
**Source:** 5x (max sweep rate 10 ns/div)

#### Magnifier

#### CRT

Philips D14 - 160 GH/09 post accelerator, 10 kV accelerating potential. P 31 phosphor. P 7 available as an option.  
**Screen dimensions:** 8 x 10 divisions of full centimeters internal graticule. (Storage CRT: 0.9 cm divisions)

#### SUPPLY VOLTAGE

100 - 260 V selectable, 46 - 440 Hz  
Consumption 100 W approx.

#### DIMENSIONS AND WEIGHT

**Height** : 24,5 cm  
**Width** : 34 cm  
**Depth** : 53,5 cm  
**Weight** : 18 kg approx.

A full range of accessories is available. Please ask for Oscilloscope accessory Brochure.