7250 Transient-Digitizing Oscilloscope

GPIB IEEE-488 The 7250 partially complies with IEEE Standard 488.1-1987 and with Tektronix *Standard Codes and Formats.*

- **6-GHz Bandwidth**
- **50-ps Rise Time**
- **5-V Full-Scale Sensitivity**
- **11-Bits (2048 Points) Vertical Resolution**
- **50-ps/Div Fastest Sweep**
- **9-Bits (512 Points) Horizontal Resolution**
- **Trigger Jitter 100 ps or Less**
- **Fully Programmable Via GPIB**
- **Programmable Sweep Delay**
- **Internal Memory To Save 15 (Optional 31) Waveform Acquisitions And 4 Front-Panel Setups With Five-Year Battery Backup**
- **Target-Defect Correction**
- **Filtering And Smoothing**
- **On-Screen Cursors**
- **Built-In Waveform-Parameter Measurements**
- **Sinusoidal Sweep (Rossi) Input Capability**

The Tektronix 7250 Transient-Digitizing Oscilloscope is a high-speed instrument that can acquire fast single-shot or repetitive signals and display them digitally. It is designed specifically to capture and record very high-frequency, fast rise-time pulses. The instrument provides a dc to 6-GHz (−3 dB) bandwidth, 50-picosecond rise time, and is fully programmble via GPIB.

Transient Digitizing Lets You View and Digitize Single-Shot Events or Non-repetitive Waveforms.

The scan conversion used in the 7250 lets you do all this at very high frequencies and fast rise times, something most digitizing oscilloscopes cannot do. Waveforms are processed for display on the TV-type monitor.

Other major features of the 7250 are menu-driven operation and on-screen cursors for ease of operation. Fast setup, immediate feedback with the built-in monitor, and interactive controls also contribute to operating ease.

Split-screen operation lets you compare a stored waveform with a newly acquired waveform or display two acquisitions on one screen. The ability to measure important waveform parameters is built-in, and it is fully programmable via GPIB. Also, the instrument is designed to rigorous standards for modularity, easy repair, and ruggedness. It is built to maintain its performance in adverse environments.
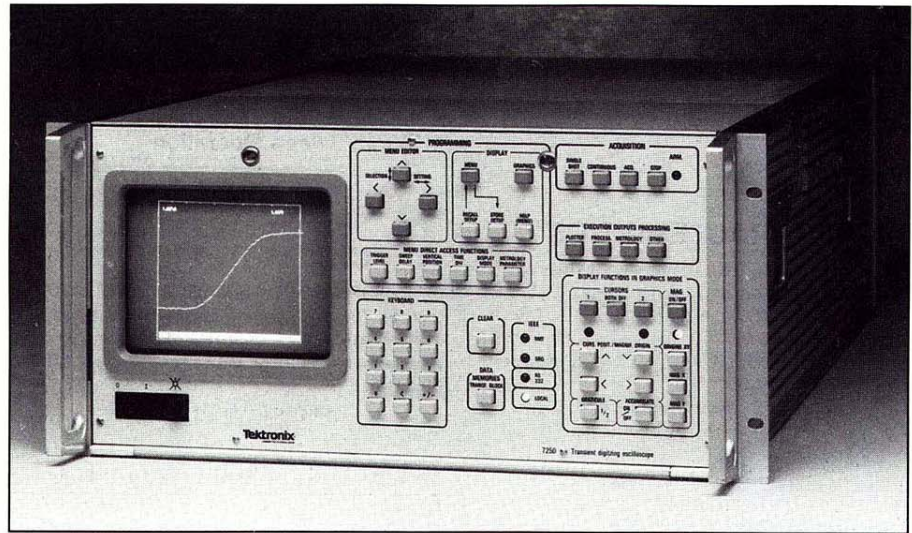
APPLICATIONS
Particle Physics Research
The challenge in this type of research is the recording of nonrepetitive, high-voltage, fast-rise, narrow pulses. The 7250 was built specifically for these kinds of measurements and handles them with ease. These types of signals cannot be measured on most digitizers or digital-storage scopes because they require repetitive waveforms and typically do not handle the high frequencies and fast transition times involved.

High-Power Laser Research
A transient-digitizing oscilloscope is the ideal instrument for capturing transient electrical phenomena in laser research. The 7250 can capture and digitize this data and, because the instrument is fully programmable and GPIB compatible, the data can be fed directly to a minicomputer for fast analysis after each laser shot.

CHARACTERISTICS
VERTICAL
Bandwidth—DC to 6 GHz (−3 dB).
Rise Time—50 ps ±5 ps.
Sensitivity—5 V±15%, full scale.
Input Impedance—50 Ω ±2 Ω.
Input VSWR—Less than 1.5 (0 to 2 GHz), less than 2.5 (2.5 to 7 GHz).
Loop-Through Transmission-Line Loss—Less than 2 dB (0 to 5 GHz).
Maximum Input Voltage—2 kV (1-μs duration).
**Vertical Position**—0 to 100% in 1% steps.

HORIZONTAL
Sweep Rates—1 μs to 50 ps/div, 14 ranges in a 1,2,5 sequence.
Sweep Accuracy—2% over center 8 divisions.
Sweep Linearity—1.5% of full scale on center 8 divisions. No worse than 0.15 division in any one division.
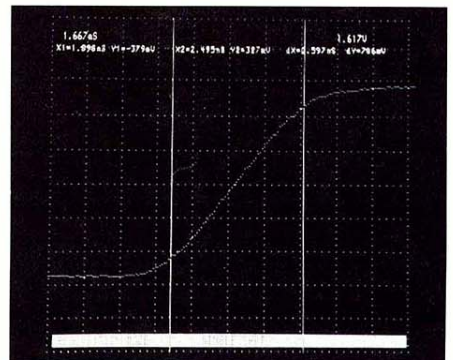
TRIGGERING
Source—External triggering only. Requires 50-ns, ± slope pre-trigger signal. Optional delay line provides trigger pick-off.
Coupling—direct.
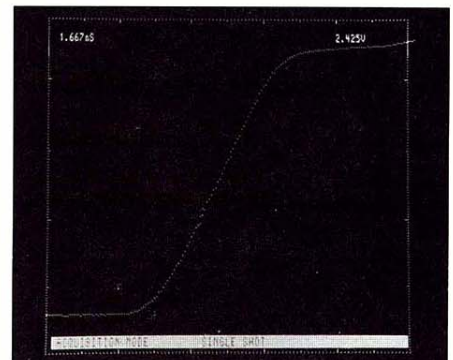
7250 CRT display of pulse rise-time measurement.

7250 CRT photo of on-screen cursors. Cursors show the vertical and horizontal setting at any two points on the display, plus the difference between these two points.

Level—Programmable 50 mV to 10 V in two ranges.

Modes—Normal: pulse duration greater than 10 ns; Fast: pulse duration greater than 400 ps and less than 20 ns.

Input Impedance—50 Ω ±5%.

Maximum Input—250 mW, 500 V peak-to-peak at 1-μs duration.

Jitter—100 ps or less (peak-to-peak).

Delay Drift—±500 ps, over the period of 10 minutes to 1 hour at 50 ps/div and 100-ns sweep delay.

Sweep Delay—Minimum delay 50 ns ±2 ns. Adjustable in 5 ranges: 50 to 100 ns (50-ps resolution), 100 to 150 ns (100-ps resolution), 150 to 500 ns (500-ps resolution), 500 ns to 1 μs (1-ns resolution), and 1 to 5 μs (5-ns resolution).

DIGITIZER

Resolution—11 bits vertical, 9 bits horizontal (2048 vertical points, 512 horizontal points).

Memory—Internal memory to save 15 waveform acquisitions (31 acquisitions with optional additional memory) with five-year battery backup. Can also save 4 front-panel setups.
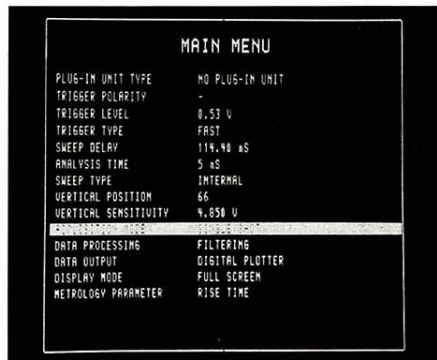
7250 CRT photo of MAIN MENU. The MAIN MENU lets you select and change the parameter you want. Other menus available are secondary MENU for setting internal parameters and a HELP MENU for viewing the choice of settings available.
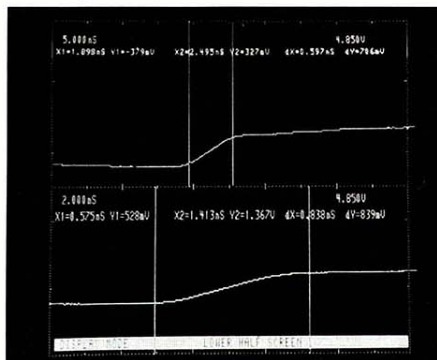
7250 CRT photo of split-screen display. The split screen lets you display and make measurements on two waveforms simultaneously.

WAVEFORM PROCESSING

Target Defect Correction—Corrects for defects in the reading-tube image target.

Filtering—Redundant y values are suppressed and missing y values are created.

Smoothing—Mathematical smoothing operation based on averaging over adjacent points.

Acquisition Modes

Single Shot—Acquires and displays a waveform one time.

Continuous—Continuously acquires and displays waveforms.

Burst—Acquires and stores several waveforms in successive memory blocks. Number of acquisitions is set by the user up to the maximum memory locations.

Average—Acquires and averages a number of waveform acquisitions, then displays the averaged waveform. Number of averages is set by the user, 256 maximum.

Envelope—Acquires a number of waveforms set by the user, 256 maximum. After the last acquisition, the envelope is updated, and the curve is displayed.

Defects Correction—Acquires a waveform a number of times set by the user. A table of faults from the waveform is updated in memory for subtraction from any stored curve.

Electrical Zero—Allows acquisition of an electrical baseline, and acquires a waveform a number of times set by the user. At each acquisition, an average curve in a buffer area is updated. After the last acquisition, an electrical zero value is calculated, stored, and can then be used with the cursors.

WAVEFORM MEASUREMENT

Electronic Graticules—Full screen or border only.

Cursors—Two vertical cursors with CRT readout of x and y coordinates of cursor and waveform crossing point, plus delta time and voltage between cursors.

Magnifier—Cross-hair type cursors for setting display window to be magnified. Provides up to 16 times magnification both vertically and horizontally.

Automatic Measurement—Min/max, peak-to-peak, average value, rms value, rise time/fall time, pulse width, delay time, delta time.

INPUTS/OUTPUTS

Signal Input, Signal Output, GPIB*[1], Control Video, Trigger Input.

RS 232C—Plotter output.

Video Monitor-CCIR output and sync input.

External Sweep Input—Allows use of sinusoidal (Rossi) sweep to 3 GHz.

[1] Does not comply with all provisions of IEEE 488.1-1987 or with Tektronix Standard Codes and Formats.

OPTION 01 EXTERNAL DELAY LINE

Bandwidth—≥4.5 GHz.

Attenuation—4.5 dB ±0.5 dB.

Delay—55 ns ±2 ns.

Rise Time—≤75 ps.

Maximum Input Voltage—5 Vdc.

Maximum Pulse Input—60 V.

Input Impedance—50 Ω ±5%.

Input/Output Connectors—N type.

Trigger Pickoff—Attenuation, 20 dB±1 dB; rise time 300 ps; connector, BNC.

Dimensions—19-in. rack width; 2 rack units height; 32.5-in. (800 mm) depth.

ENVIRONMENTAL

Temperature—Operating: 0 to 40°C. Nonoperating: −10 to 70°C.

Altitude—Operating: 3 km (10,000 ft). Nonoperating: 12 km (40,000 ft).

Humidity—Operating: 90% at 40°C.

POWER REQUIREMENTS

Line Voltage—115 V ±10%, 220 V ± 10%.

Line Frequency—50 to 60 Hz ±4%.

Power Consumption—200 W.

PHYSICAL CHARACTERISTICS

Dimensions	mm	in.
Width	483	19.0
Height	222	8.7
Depth	915	36.0
Weight ≈	kg	lb
Net	60	132.3
Shipping	110	242

ORDERING INFORMATION

7250 6-GHz Transient-Digitizing Oscilloscope   **$99,995**

OPTIONS

Option 01—External delay line   **+$12,500**
Option 2D—Extended Memory   **+$2,400**

INTERNATIONAL POWER PLUG OPTIONS

Option A1—Universal Euro 220V, 50 Hz.
Option A2—UK 240V, 50 Hz.
Option A5—Switzerland 220V, 50 Hz.

OPTIONAL ACCESSORIES

HC01—4×5 in. Video Copier.
See page 502.   **$1,235**
HC02—8×10 in. Video Copier.
See page 502.   **$1,645**