

Digitize and store single-shot or repetitive signals of millisecond to subnanosecond duration.

500 MHz bandwidth at 10 mV/div.

500 ps/div fastest calibrated sweep rate.

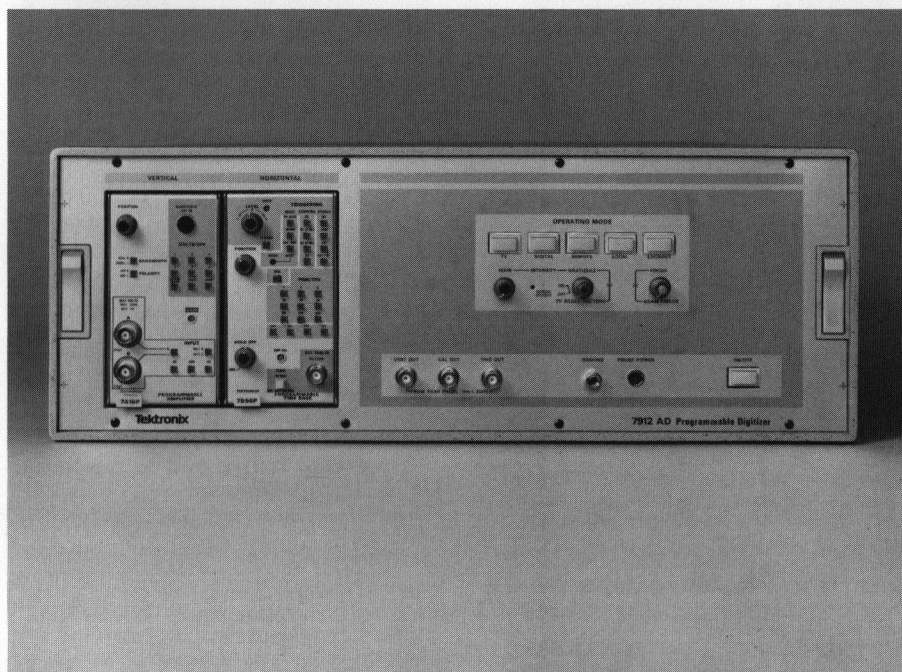
Waveform digitizing to 9-bit vertical and 9-bit horizontal resolution.

Built-in signal averaging capability.

Fully programmable over GPIB for system-oriented operation.

Complies with IEEE Standard 488-1975 and Tektronix Standard Codes and Formats.

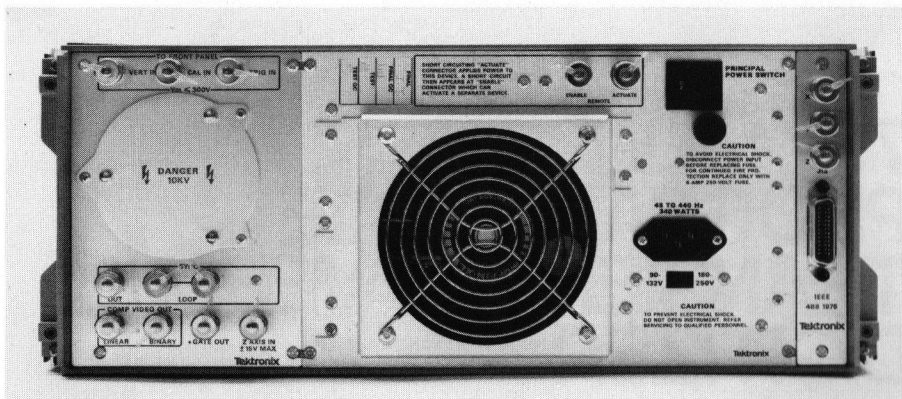
7912AD PROGRAMMABLE TRANSIENT WAVEFORM DIGITIZER



Capturing high-speed waveforms is the 7912AD's forte. Each waveform can be sampled up to 512 times within a selectable time window, ranging from ten milliseconds to five nanoseconds (50 kHz to 100 GHz equivalent sampling rate).

This performance is accomplished by a Tektronix scan converter which writes the signal onto a silicon-diode target array. In TV mode, the signal information is read from the target and converted to composite video for a bright display on a television monitor. However, in the Digital mode the waveform data is read into an internal memory. From this memory, the digitized waveform can be transferred via the GPIB to an external controller for processing.

The 7912AD Mainframe is programmable over the GPIB. When the programmable plug-ins (one 7A16P Programmable Amplifier and one 7B90P Programmable Time Base) are used, the 7912AD becomes a fully programmable digitizer with a bandwidth of 200 MHz. This is a significant step toward fully automated test and measurement in disciplines such as laser and energy-related research, component or subassembly testing, and other areas requiring information extraction from high-speed waveforms.



Characteristics

Vertical System

Channels—Single plug-in compartment accepts any 7000 Series amplifier plug-in. Fully programmable when 7A16P is used.
Bandwidth—Determined by amplifier plug-in. 7A16P: 200 MHz. 7A29: 500 MHz.
Delay Line—Permits viewing of leading edge of acquired waveform.

Horizontal System

Channels—Single plug-in compartment accepts any 7000 Series time base. Fully programmable with 7B90P.
Fastest Calibrated Sweep Rate—500 ps/div with the 7B90P or 7B92A Time Bases.
Slowest Recommended Sweep Rate—1 ms/div in digital mode.

Digitizing and Storage

Method—Scan conversion.

Resolution—Nine bits. In the Digital Mode, the target is scanned in a 512 × 512 point matrix offering at least 400 discrete horizontal elements, each with a range of at least 320 discrete vertical values. In the TV Mode, the target is scanned in a standard TV format with a resolution of at least 400 lines at 50% response.

Writing Rate (+10°C to +40°C)—TV Mode: writes an 8-div sine wave of at least 500 MHz in a single sweep. Digital Mode: stores a single 8-div pulse with a risetime of 1 ns or less.

Target Defects—No more than six points digitized other than those written by input waveform. Built-in firmware allows for defect removal by an external controller.

Memory—Type: semiconductor. Size: 4096 10-bit words for data from target and two 512 16-bit word areas for internally processed and reduced data. Record Length: 512 samples per waveform maximum.

Electronic Graticule

8 × 10 division dot matrix written onto the scan converter target immediately after waveform acquisition. Can be displayed simultaneously with the input signal on the TV monitor or digitized and stored.

Outputs/Inputs

X, Y, Z Analog Output—Provides for analog display of data in memory. X and Y level is 1 V peak-to-peak into 100 k Ω or greater; adjustable from 0.75 V to 1.3 V. Z level is 0 to 1 V (full white) into 100 k Ω or greater.

Composite Video Output—Only available in TV mode. Used to drive a TV monitor for displaying signal written on scan-converter target as an aid to setting intensity for complete digitizing. Linear Output: Replica of the signal read from the target with sync added. Binary Output: Two-level output

derived from the linear composite video output. Used to indicate on the TV monitor how well a waveform will be digitized. Scale factor readout included in both linear and binary.

Sync Output—At least 4 V into 75 Ω .

Conforms to EIA RS-170.

Sync Loop—Allows TV Mode to be synchronized with external EIA RS-170 sync waveform.

+ Gate Output—Provides a positive pulse with a duration equal to and coincident with the time-base sweep.

Z-Axis Input— ± 1 V input modulates the writing gun intensity over its full range.

Vert In, Cal In, Trig In—Three internal 50 Ω coaxial cables connect signals from the rear panel to the front panel to ease system configuration in rackmounts.

Probe Power—Provides power for Tektronix active probes.

IEEE Standard 488 Interface

Standard—Conforms to IEEE Standard 488-1975.

Interface Functions Subset Implemented:

SH1	Complete source handshake
AH1	Complete acceptor handshake
TE6	Extended talker function
LE4	Extended listener function
SR1	Complete service request capability
RL1	Complete remote/local function
PP0	No parallel poll
DC1	Complete device clear capability
C0	No controller function
DT1	Device trigger complete.

Environmental

Temperature Range—Operating: 0°C to +40°C. Nonoperating: -55°C to +75°C.

Altitude—Operating: Up to 4750 m (15,000 ft). Nonoperating: Up to 15,200 m (50,000 ft).

EMC (plug-ins inserted)—Meets MIL-STD-461A and 462 radiated and conducted interference from 30 Hz to 1 GHz.

Power Requirements

Line Voltage Range—90 V to 132 V ac and 180 V to 250 V ac.

Line Frequency—48 to 440 Hz.

Power Consumption (including plug-ins)—360 W maximum.

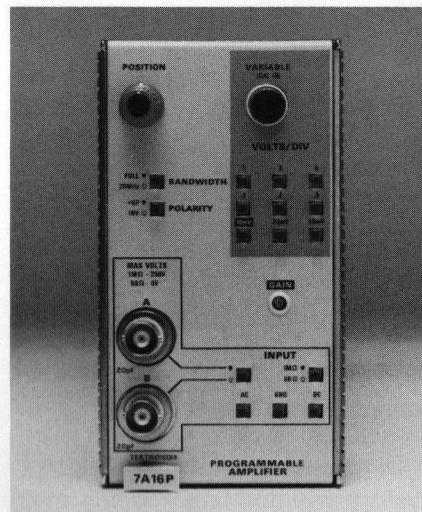
Remote Control—Remote power ON/OFF capabilities provided.

Physical Characteristics

Dimensions	mm	in
Width	483	19.0
Height	178	7.0
Length	679	26.8
Weight	kg	lb
Net	24.7	54.6

Included Accessories

Power cord (161-0066-00); set of rack slides (351-0375-01); IEEE-488 Bus Cable (012-0630-03); Instruction Manual.



Programmable Amplifier 7A16P

Fully Programmable Plug-in for 7912AD or 7612D Digitizers Only

10 mV/div to 5 V/div Calibrated Deflection Factors

200 MHz Bandwidth (7900 Family)

50 Ω or 1 M Ω Input Selectable

The 7A16P is designed for use in Tektronix 7000 Series programmable digitizers. All of the normal operational features of a high-quality, wide-band 7000 Series plug-in amplifier are provided in the 7A16P. These are available at the front panel for manual selection, or they can be set under program control via a programmable mainframe and the GPIB.

Whether operated manually or under program control, the front-panel push buttons light to indicate plug-in status. Plug-in status can also be read over the GPIB by an external controller for input to instrument setup and control routines.

Two switch selected input connectors are also provided for selecting input signal source.

Characteristics

Bandwidth—Plug-in Only: 225 MHz. With the 7912AD: 200 MHz. Bandwidth may be limited to 20 MHz \pm 3 MHz by bandwidth limit switch.

Ac Coupled Lower Bandwidth—10 Hz or less

Step Response—50 Ω input plug-in only, 1.8 ns risetime.

Deflection Factor—10 mV/div, 9 steps in a 1-2-5 sequence. Accuracy is $\pm 2\%$ of indicated deflection factor with Gain adjusted at 10 mV/div. Uncalibrated variable is continuous between steps and extends selected deflection factor to at least 2.5 times the calibrated value.

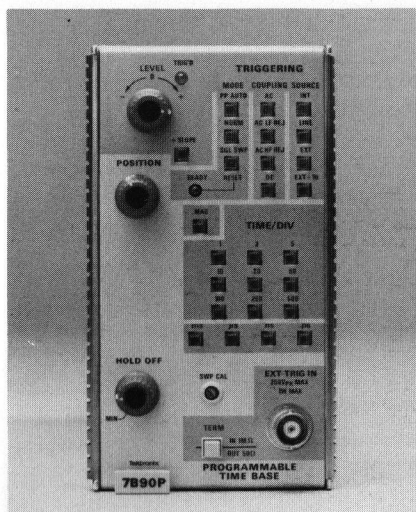
Input R and C—Selectable: 1 M Ω within 2% and paralleled by ≈ 20 pF or 50 Ω $\langle 1 \Omega$ with vswr $\leq 1.5:1$ at 200 MHz or less.

Inputs—Selectable A or B signal input connectors.

Maximum Input Voltage—1 M Ω , Dc Coupled: 250 V (dc + peak ac), ac component 500 V p-p maximum, 1 kHz or less. 1 M Ω , Ac Coupled: 500 V (dc + peak ac), ac component 500 V p-p maximum, 1 kHz or less. 50 Ω : 0.5 W maximum.

Programmable Functions—All functions except Variable, Gain, and Identify are programmable.

Included Accessory—Instruction manual.



Programmable Time Base 7B90P

500 ps/div to 500 ms/div
Calibrated Time Base

Fully Programmable Plug-in 7912AD Digitizer Only

400 MHz Trigger Bandwidth

Single-Sweep Operation

The programmable 7B90P is designed for use with a Tektronix 7912AD Programmable Digitizer.

Its operating functions can be manually selected at the front panel or selected under program control via the GPIB.

The only nonprogrammable functions are the Sweep Calibration adjustment and the External Trigger Input Terminator Switch.

Characteristics

Sweep Rates—500 ms/div to 10 ns/div in 24 steps. Magnifier extends fastest calibrated sweep rate to 500 ps/div.

Sweep Accuracy—Measured over center 8 div, +15°C to +35°C, with any 7000 Series programmable mainframe. Derate accuracies by an additional 1% for 0°C to +50°C.

Time/Div	Unmagnified	Magnified
500 ms/div to 100 ns/div	2%	3%
50 ns/div to 10 ns/div	3%	4%
500 ps/div	—	5%

Trigger Holdoff—Programmable in 62 steps between minimum and maximum.

Time/Div	Min (ccw)	Max (cw)
500 ps/div to 2 μ s/div	$\leq 3.5 \mu$ s	$\geq 90 \mu$ s
5 μ s/div to 20 μ s/div	$\leq 35 \mu$ s	$\geq 900 \mu$ s
50 μ s/div to 200 μ s/div	$\leq 350 \mu$ s	≥ 9 ms
500 μ s/div to 2 ms/div	≤ 3.5 ms	≥ 90 ms
5 ms/div to 500 ms/div	≤ 35 ms	≥ 900 ms

Trigger Sensitivity

P-P AUTO MODE		
Triggering Frequency Range	Min Signal Required	
	Int	Ext
At least 50 Hz	2.0 div	500 mV
200 Hz to 50 MHz	0.5 div	125 mV
50 MHz to 400 MHz	1.5 div	375 mV

NORM MODE			
Coupling	Triggering Frequency Range	Min Signal Required	
		Int	Ext
Ac	300 Hz to 50 MHz	0.3 div	100 mV
	50 MHz to 400 MHz	1.5 div	250 mV
Ac LF Rej*2	30 kHz to 50 MHz	0.3 div	100 mV
	50 MHz to 400 MHz	1.5 div	250 mV
Ac HF Rej*3	30 Hz to 50 kHz	0.3 div	100 mV
Dc	Dc to 50 MHz	0.3 div	100 mV
	50 MHz to 400 MHz	1.3 div	25 mV

*1 Ext ÷ 10 operation attenuates ext trigger signal 10 times.

*² Will not trigger on sinewaves of <8 div Internal, or 3 V External, at or below 60 Hz.

*3 Will not trigger on 50 MHz sinewaves 1.5 div or less Internal or 0.15 V or less External.

Single-Sweep Mode—Same as Norm mode

Trigger Level—Programmable in 0.05 div steps.

Horizontal Position—Programmable in 0.0125 div step, unmagnified, 0.125 div step magnified.

Internal Trigger Jitter—0.1 ns or less at 400 MHz.

External Trigger Input—Selectable: 1 M Ω \pm 5%, 20 pF \pm 10% or 50 Ω \pm 5% with 1.22 maximum vswr at 400 MHz. Maximum input is 250 V (dc + peak ac) for 1 M Ω or 1 W for 50 Ω . The level range (excluding p-p Augo) for a 1 kHz sine wave input is at least \pm 3 V in Ext and at least \pm 3 V in Ext and at least \pm 30 V in Ext \times 10.

Included Accessory—Instruction manual.

Ordering Information

It is recommended that 7912ADs not be purchased or operated without an accompanying Tektronix 634 Raster Scan Display Monitor.

7912AD Programmable Digitizer

Option 13—Change TV Scan to 625 lines at 50 Hz

Option 30—Delete GPIB Cable

7A16P—Programmable Amplifier
7B90P—Programmable Time Base

634 Raster Scan Display Monitor

International Power Cords and Plug Options

Option A1—Universal Euro 220 V/16A, 50 Hz

Option A2—UK 240 V/13A, 50 Hz

Option A3—Australian 240 V/10A, 50 Hz

Option A4—North American 240 V/15A, 60 Hz

Option A5—Switzerland 240 V/10A, 50 Hz

For further information, contact:

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& South America, Japan**

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