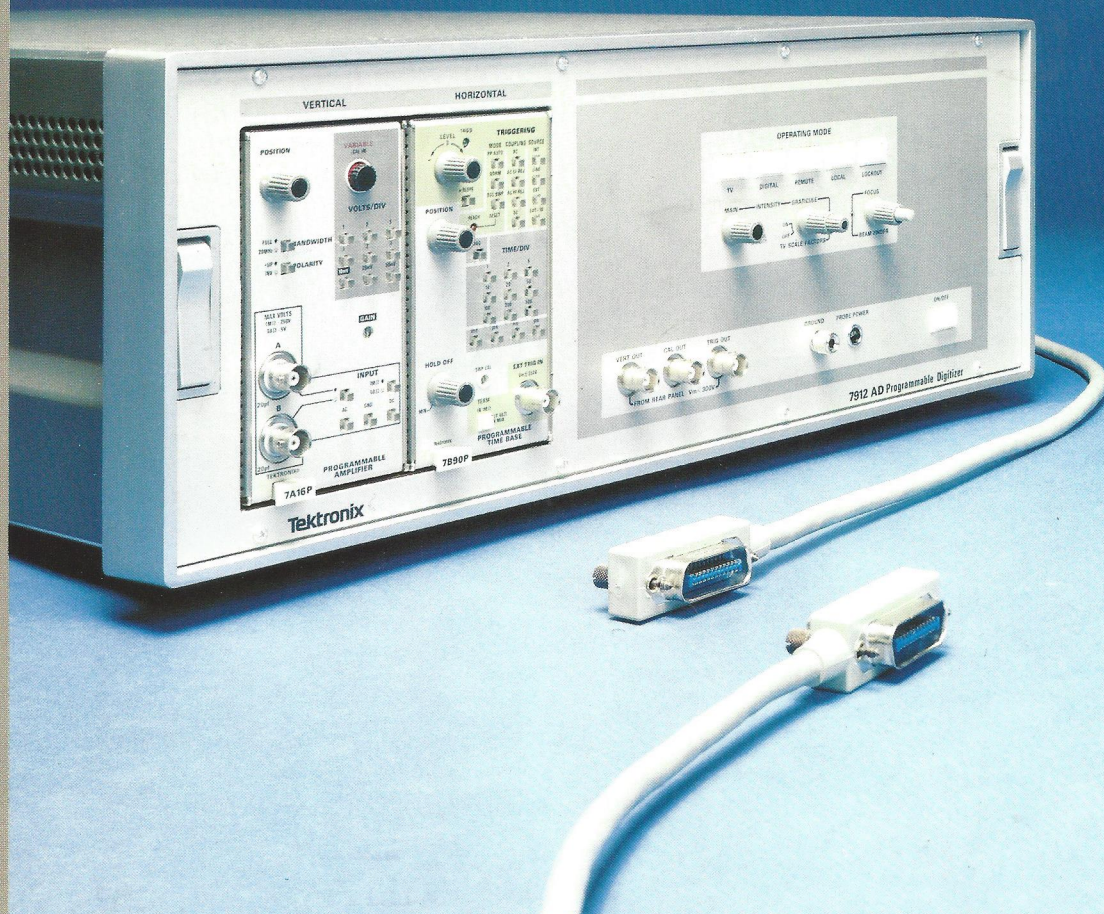




WAVEFORM DIGITIZING INSTRUMENTS And Systems

7912AD Waveform Digitizer IEEE488



Programmable Acquisition and Analysis

Look at the new horizon in Tektronix waveform digitizers. The R7912 Transient Digitizer is still the world leader in analog-to-digital conversion of ultra fast transients. Now Tektronix introduces the first fully programmable waveform digitizer, the 7912AD.

Like its older brother, the 7912AD captures high speed transients and converts them into practical, useful information. But the 7912AD can be entirely automatic, operating under local or remote program control. And it is IEEE 488 compatible.

With unprecedented performance, the 7912AD maximizes the speed and usefulness of test results and minimizes the dependence upon skilled interpretation of measurement parameters. It provides a digitized writing rate of 8,000 equivalent divisions per microsecond. Or you may also use the 7912AD with a TV monitor which provides a visual writing rate of 30,000 equivalent divisions per microsecond.

To further accommodate the user, the format of the digital data output is arranged to make it easy for the instrument to be used with a wider range of controllers. While the instrument is compatible with many different intelligent terminals or programmable calculators, greater measurement potential is realized when it is used with a TEKTRONIX CP4165 Instrument Controller and TEK SPS BASIC waveform processing software.

See it, record it, program it

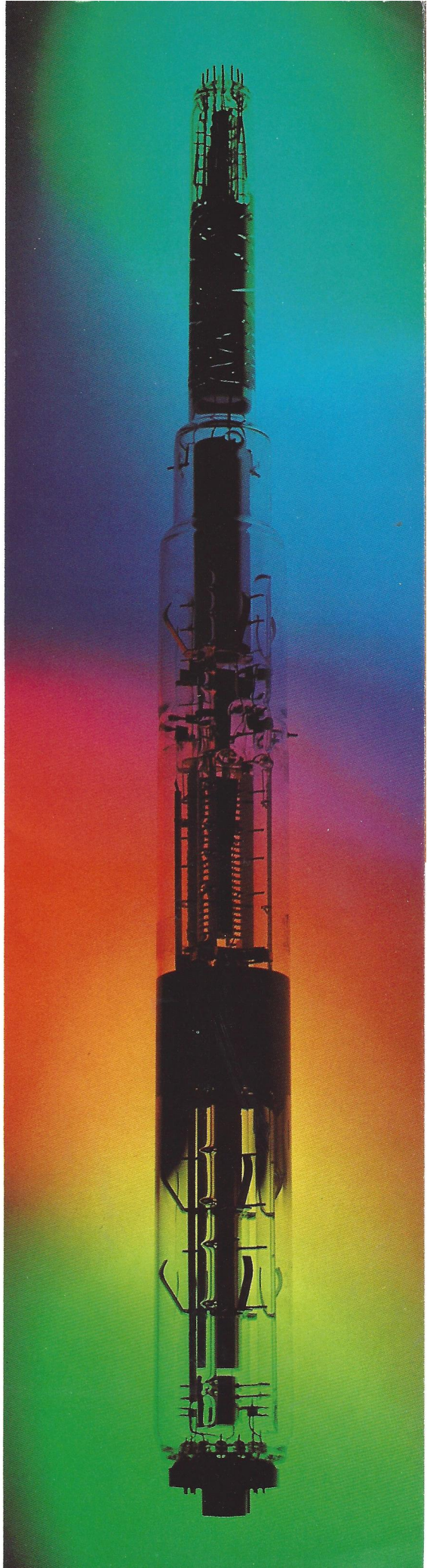
The 7912AD Waveform Digitizer has the equivalent capability of an analog-to-digital converter, with a variable clock rate of up to 100 GHz. The 7912AD is a state-of-the-art instrument that uses a scan converter to digitize waveforms containing frequencies as high as 1 GHz or as low as 10 KHz. Since the digital values are assigned after the waveform is written and not while it is occurring, as in conventional digitizers, the result is high gain and unexcelled bandwidth.

The digitized waveform, acquired from either non-recurring (single-shot) or recurring signals (including those with low duty cycles), can be stored indefinitely in the 7912AD's self-contained 4096-word memory. This data can be immediately accessed by any IEEE 488 compatible storage device or controller (up to 50 waveforms per second). Or the waveform is available for immediate viewing on an X-Y TV monitor, offering convenient visual measurements.

Controller processed waveforms may be displayed on a TEKTRONIX terminal and instant copy is available with a TEKTRONIX hard copy unit. TV outputs can be recorded on a video tape recorder for subsequent playback and visual analysis, eliminating time-consuming photography.

And now all this is possible without operator intervention. Automatic waveform digitizing allows you to make oscilloscope-type measurements under local or remote control. A microprocessor takes over the instrument control requirements and built-in firmware provides on-board intelligence and self-diagnostic routines. The instrument checks itself out when you switch it on.

You achieve greater proficiency in acquiring waveform data because the 7912AD provides greater potential for improved measurement analysis and testing techniques. No longer limited by the time and expense of manually digitizing a waveform, you can now use the 7912AD to collect and store signals, automate testing, or transmit signal data over long distances. No longer burdened by the probabilities of human error, you can now use the 7912AD to obtain high degrees of accuracy and repeatability.



Remote/local switch...
locks out front panel
control

On-board firmware for
diagnostics and data for-
matting

TV Mode > 30,000 equiv-
alent divisions per micro-
second

Digital Mode > 8000
equivalent divisions per
microsecond digitized
writing rate

Feed-through connec-
tions to plug-ins from
rear panel

Up to 50 waveforms per
second throughput

Two-place plug-in com-
partment... large choice
of 7000 Series Plug-ins

Up to 500 MHz at 10
mV/div

IEEE 488

SH1

AH1

TE6

LE4

SR1

RL1

PP0

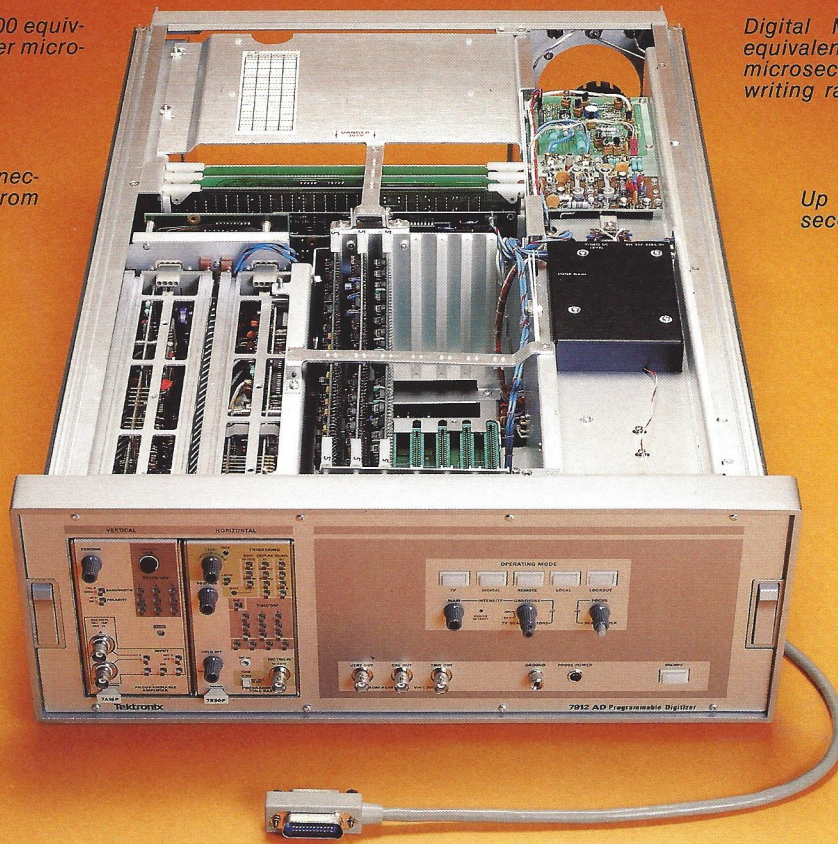
DC1

DT1

C0

Up to 1 GHz at 4 V/div
with 7A21N Direct
Access Plug-in

Sweep rates to 500 pico-
seconds/div



Microprocessor-con-
trolled via IEEE 488 inter-
face

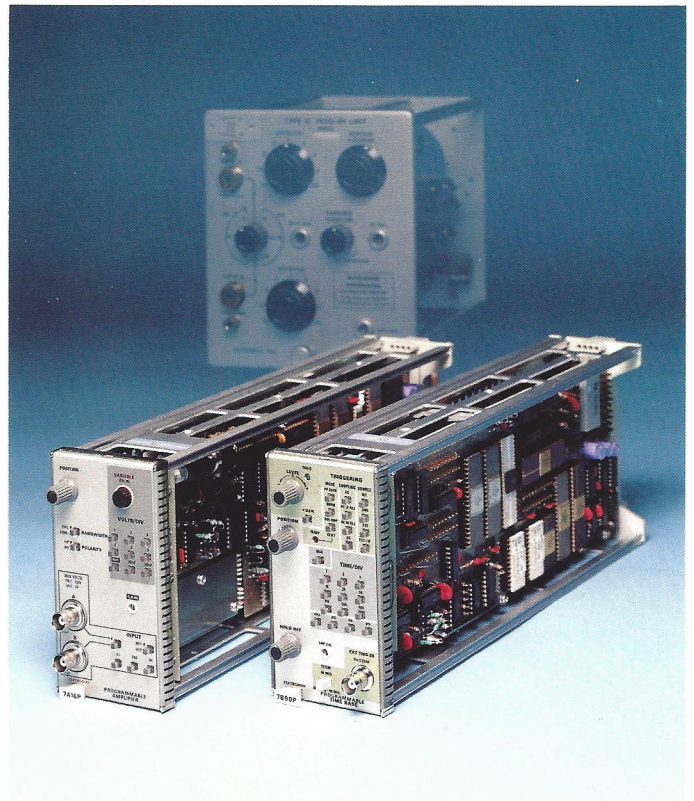
7000 Series Programmable Mainframe

The originators of the plug-in concept now bring you programmable plug-ins

You can select from a wide range of 7000 Series Plug-ins. And now Tektronix introduces two fully programmable plug-ins, the 7A16P Amplifier and the 7B90P Time Base. With this plug-in selection, you can solve problems in many applications. This variety lets you tailor your instrument to meet your immediate needs and to expand its capabilities as your needs change.

The 7A16 Programmable Amplifier is similar to the 7A16 Amplifier with the additional capability of remote programming. All functions except VARIABLE, GAIN and IDENTIFY may be programmed or interrogated via the mainframe IEEE 488 interface. The 7A16P controls include POSITION, VARIABLE, GAIN (calibration adjust) BANDWIDTH, POLARITY, VOLTS/DIV., AB (input), 1 Megohm/50 ohm (input), COUPLING (AC, DC, GND), IDENTIFY (available at probe tip, disabled under program control).

The 7B90 Programmable Time Base is similar in characteristics to the 7B80. Designed for use in 7000 Series programmable mainframes, the 7B90P allows remote programming or interrogation of all functions except the EXT termination via the mainframe IEEE 488 interface. The 7B90P controls include POSITION, HOLDOFF, TRIGGERING, and RATE (Time/Div., 14 push buttons for sweep rate in 1, 2, 5 sequence, plus mag).



7912AD WAVEFORM DIGITIZER SPECIFICATIONS

OUTPUTS

Digital Mode — IEEE 488 bus connector: 8-bit parallel, byte-serial data input/output (conforms to IEEE 488, 1975). Left-of-trace-justified waveform data and graticule are transmitted as 10-bit values in byte pairs (MSB is defect flag). Scale factors are transmitted in ASCII. X, Y, Z monitor: Waveform data in memory converted to analog signals to drive a display monitor. X and Y are 1 V p-p into 100 kilohms or greater; Z is 0 to 1 V (full white) into 100 kilohms or greater.

TV Mode — Composite video: 525 line, 60 Hz TV scan (conforms to EIA RS-170); 1 V into 75 ohms for full white. Sync is included. Video includes acquired waveform, graticule, and scale factors (added to video, but written on target). Both linear and binary (two-level) composite video are provided. Sync: At least 4 V into 75 ohms (conforms to EIA RS-170).

Gate — 0.5 V pulse into 50 ohms (10 V into 1 megohm) coincident with and equal in duration to time base sweep.

INPUTS

Sync Loop (Loop through) — Allows TV Mode output to be synchronized with EIA standard sync waveform.

Z Axis in — ± 1 V into approximately 1 kilohm modulates the writing gun over its full range.

Feedthrough Connectors — Three internal 50 ohm coaxial cables connect signals from the rear panel to the front panel to ease system configuration in a rack.

VERTICAL DEFLECTION SYSTEM

Plug-ins — Vertical plug-in compartment accepts either programmable or non-programmable TEKTRONIX 7000 Series amplifier plug-ins. If a dual-channel amplifier is used, chop rate is determined by the plug-in.

Bandwidth — Determined by amplifier plug-in. 7A19: 500 MHz, 10 mV/div to 1 V/div. 7A16P: 200 MHz, 10 mV/div to 1 V/div. 7A21N Direct Access: 1 GHz at approximately 4 V/div (no graticule).

Delay Line — Permits viewing or digitizing leading edge of acquired waveform.

HORIZONTAL DEFLECTION SYSTEM

Plug-ins — Horizontal plug-in compartment accepts either programmable or non-programmable TEKTRONIX 7000 Series time-base plug-ins.

Fastest Calibrated Sweep Rate — 500 picoseconds/division with 7B90P, 7B80GB, or 7B92A Time Bases.

ELECTRONIC GRATICULE

Format — Dot matrix of 8 x 10 divisions written on the scan converter target immediately after a waveform is acquired. The matrix is acquired and displayed or digitized through the same path as the signal from the plug-ins.

Stability — 0.5% (0° to +40° C); 0.1% (+20° to +30° C).

SCAN CONVERTER CRT

Type — dual-gun, double ended. Signal is written on and read from a silicon-diode target.

Resolution — 512 x 512 target matrix. At least 400 discrete horizontal elements with a range of at least 320 discrete vertical values. The TV Mode display resolution is at least 400 lines at 50% response.

Writing Rate — 8,000 equivalent divisions/microsecond in digital mode; 30,000 equivalent divisions/microsecond in TV mode.

MEMORY

Type — Semiconductor, non-destructive readout.

Size — 1 waveform with graticule and scale factors; 4,096 10-bit words.

POWER REQUIREMENTS

Line Voltage — 115 V, nominal (90 to 132 V ac), 230 V, nominal (180 to 250 V ac); selected by rear-panel switch.

Line Frequency — One side of input line must be neutral. 48 to 440 Hz.

Power Consumption — 320 watts, typical.

ENVIRONMENT

Operating Temperature Range — 0° to +40° C.

Operating Altitude — Up to 4500 meters (15,000 feet). Up to 15,000 meters (50,000 feet) non-operating.

SIZE AND WEIGHT

Height — 17.7 cm (7 in).

Width — 48.3 cm (19 in), front panel.

Length — 64.6 cm (25.5 in) within rack, 67.9 cm (26.8 in) total.

Weight — Approximately 22.7 kg (50 lbs) without plug-ins.

STANDARD ACCESSORIES

Power cord — 2.4 m (8 ft).

Rack slides — 1 set.

IEEE bus cable — 2 m (6.6 ft).

Manuals — 1 Operators (includes programming), 1 Service.

OPTIONS

04 Change to Fast Digitize (changes target matrix to 256 x 256 points, changes electronic graticule to mark only every other division, increases writing rate to at least 20,000 equivalent divisions/microsecond in Digital Mode.)

13 Change TV scan to 625 lines at 50 Hz.

30 Delete IEEE bus cable.

31 Delete IEEE bus interface and cable.

40 Delete firmware for onboard data processing.

PROGRAMMABLE FUNCTIONS

All instrument controls, with the exception of POWER ON/OFF, BEAMFINDER, and CALIBRATE, are programmable.

Interface Function Subsets, as defined in IEEE 488-1975 are

SH1	RL1
AH	PPO
TE6	DC1
LE4	DT1
SR1	CØ

Bus addresses are selected by switches on the interface circuit card. Primary addresses can be set over the full range allowed by the IEEE standard. Secondary addresses are used to distinguish between the mainframe and the programmable plug-ins.

7A16 PROGRAMMABLE AMPLIFIER

Deflection Factor — 10 mV/div to 5 V/div in 1, 2, 5 sequence

Bandwidth (in 7912AD) — 200 MHz

***Input impedance** — 1 megohm, 20 pF or 50Ω VSWR 1.5 to 150 MHz

Set-up time (under program control) — 14.7 ms (typical) for HIGH level commands, 28 ms (typical) for LOW level commands.

***Power dissipation** — 17.1 W.

7B90 PROGRAMMABLE TIME BASE

Sweep speed range — 500 picoseconds to 500 ms/div, in 1, 2, 5 sequence.

Trigger bandwidth — 400 MHz

***External input impedance** — 1 megohm 20 pF or 50Ω.

Set-up time (under program control) — 15 ms (typical) for HIGH level commands, 25 ms (typical) for LOW level commands

Power dissipation — 16.6 watts

***Not programmable**

ORDER: 7912AD Programmable Digitizer

For further information or a demonstration or the name of the Sales Engineer near you, contact: Tektronix, Inc., P.O. Box 500A, Beaverton, OR 97077; phone (503) 644-0161. In Europe: Tektronix Limited, P.O. Box 36, St. Peter Port, Guernsey, Channel Islands.

Measurement Systems Division

Tektronix

COMMITTED TO EXCELLENCE

AX-3712