FEATURES/BENEFITS
- **Long Record Length**
  - **– 4 Mwords Total in 9503**
  - **– Up to 32 Mwords in 9504**
- **Data Rates to 100 Mwords/s, Dual Channel or Interleaved for 200 Mwords/s, Single Channel**
- **16 bit or 8 bit Word Width Selectable**
- **GPIB Controlled**
- **ECL or TTL Data Inputs (25 Mwords/sec.TTL)**

TYPICAL APPLICATIONS
- **High Resolution Video and CCD Test Systems**
- **"Deep Record" Ultrasonic, Radar, and Lidar Signal Acquisitions**
- **EW and EMC Signal Capture**
- **Storage Media Test Systems**
- **TEMPEST Applications**
- **Fast Data Logging of Complex Waveforms**

9503/9504 FAST DATA CACHE
- Extremely Long Record Length
- Data rates to 100 Mwords/sec
- Partitionable Memory
- Very Fast Data Logging

The 9503/9504 Fast Data Cache buffer memories provide significant record length augmentation for high speed, real time digitizers. The *9503* is a nonexpandable memory buffer configured for 2 Mwords per channel or 4 Mwords single channel. The *9504* is an expandable memory buffer that starts with 4 Mwords total memory and can be increased to a total of 32 Mwords.

LONG RECORD CAPTURE
They provide the economical solution to your digitized data storage needs for the logging of high speed, real time data records. The 9503 and 9504 in conjunction with the RTD 710/A waveform digitizer, provide the fastest real time data logging capability for multiple, complex waveforms in its class. The 9503 and 9504 support the high speed single channel mode of the RTD 710A to capture data up to 200 Mwords/second.

The 9503 or 9504 provides storage of long data records obtained from high speed analog-to-digital converters. Each product accepts up to 16-bit-wide words plus clock, at up to 100 Megawords (samples) per second. Record lengths may be from 256 words to 16 megawords per channel. In either product, the two channels may be concatenated into one long memory.

FULL DIGITIZER COMPATIBILITY
Full dual channel operation makes it fully compatible with the A/D outputs of the RTD 710 and RTD 710A

The 9504 can be configured with additional 2 megaword memory cards to provide a maximum of 16 megawords of memory per channel.

ECL DIFFERENTIAL OR TTL LEVEL INPUTS
The 16 data bit inputs are selectable in groups of 4 under program control to either ECL or TTL. Rear panel BNC connectors allow control of start and trigger of data collection. The trigger input can also be connected to use the highest of the 16 bits as an information flag.

MULTIPLE RECORDS CAPABILITY
Memory can be divided into a user-specified number of records with record length specified in segments of 256 words. Each record may be any number of 256-word segments up to the maximum size of the memory in that channel. Up to 64K separate records (256 words each) may be stored per channel in the 9504. Multiple records capability is supported in all operation modes except pretrigger.

THE 9503 AND 9504 FAST DATA CACHE
The 9503 and 9504 Fast Data Cache units allow the storage of very long data streams which have been acquired and digitized by high speed, real time waveform digitizers, such as the RTD 710 and RTD 710A. These system units are GPIB-controlled, and stored data is output via GPIB or over the high speed parallel port.

OPERATIONAL MODES

NORMAL (Independent) Mode
Both channels accept independent data streams and triggers.

INTERLEAVE Mode
Allows storage of data from channel one memory to be interleaved with data from channel two memory. Supports the RTD 710A high speed mode at 200 Mword/sec single channel. Assumes RTD 710A channel one data point zero to be first in combined record.

SEQUENTIAL Mode
Data is stored in channel 1 memory until it is full; data storage then continues in the channel 2 memory. This mode provides for all available memory to be continuous without any break in timing. The data inputs to channels 1 and 2 must be identical.

PRETRIGGER Mode
This mode connects the available channel memory into a circular buffer. The number of data words to be stored after the "trigger" is user selectable in 256 word increments.
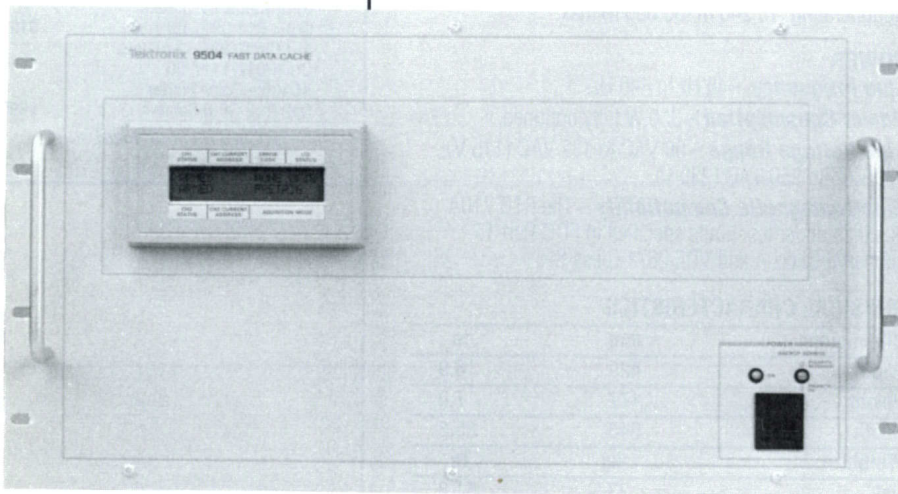
9504 Fast Data Cache Memory Buffer

The 9500 Series of Fast Data Caches complies with the IEEE Standard 488.2 and Tektronix Codes and Formats

waveform digitizers. It also accepts data from the RTD 710/A operating in the high speed mode to provide data storage at an effective sampling rate of 200 megawords per second. The standard configuration for either product provides 2 megawords of memory per channel. The 9503 memory length is fixed at 2 megawords per channel.
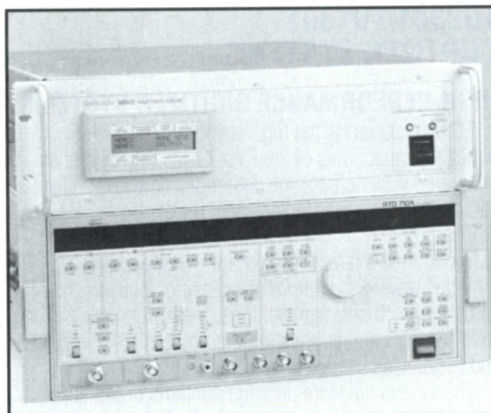
FAST THROUGHPUT CAPABILITY

The 9503 and 9504, when used in conjunction with the RTD 710/A or other digitizers having continuous digitized signal output capability, allow the capture and storage of large quantities of signal waveforms at very rapid rates. The chart below shows typical waveform capture rates (data logging throughput) for representative record sizes and sampling rates. A TTL level trigger signal is required for each record.

TYPICAL WAVEFORM ACQUISITION RATES/SEC

Record size	Max[1] no. of records stored (9504)	Input Sample Rate		
		100 MHz (10 ns)	50 MHz (20 ns)	10 MHz (100 ns)
256	65,536	>380K	>190K	>38K
512	32,768	>190K	>95k	>19K
1,024	16,384	> 95K	>48K	>9.5K
2,048	8,192	>48K	>24K	>4.5K
8,192	2,048	>12K	>6K	>1.2K
16,384	1,024	> 6K	>3K	>0.6K

[1] *Each channel (2X for single channel mode).*

CHARACTERISTICS

DIGITAL INPUT/OUTPUT SIGNALS

Number of Channels – Two independent channels.

Data Inputs – 16 bits, clock, ground; Selectable between ECL and TTL, in groups of 4 bits.

Data Input Rates –
Up to 100MHz: ECL.
Up to 25 MHz: TTL.

Start Input – Starts data capture in Pretrigger Mode; TTL signal into BNC.

Trigger Input – Starts data capture in all modes except Pretrigger and marks trigger location on data. TTL signal into BNC.

Arm Out – TTL signal from BNC. TTL low while filling data record. Inhibits RTD 710/A rearm while 9503/9504 record is filling.

MEMORY SIZE

9503: 2 MWords/channel: or 4 MWords total.
9504: 2 MWords/channel; Expandable to 16 MWords/ channel or 32 MWords total.

COMPUTER INTERFACES

GPIB – IEEE-488.2 and Tektronix Codes and Formats.

Parallel Port – A waveform data (output only) 16 bit parallel port is provided capable of 5M byte/sec (2.5M words/sec). This provides TTL level outputs and has operating modes to allow use with a wide range of computers.

RTD 710A with 9503 Fast Data Cache

ENVIRONMENTAL

Temperature Range – Operating: 0° C to 50° C. Nonoperating: −20° C to +60° C.

Relative Humidity – 0 to 95%; noncondensing.

Altitude – Operating: 4,750 m (15000 ft) max. Nonoperating: 15,240 m (50000 ft) max.

POWER

Line Frequency – 48 to 63 Hz.

Consumption –
9503: max 360 W (285 W typical).
9504: max 735 W (580 W typical) for maximum memory.

Battery Backup – Connector for battery on rear of instrument.
9503: 4.75 to 15 Volts DC, 100 mA maximum (fused).
9504: 4.75 to 15 Volts DC, 450,mA maximum (fused).

PHYSICAL CHARACTERISTICS

Dimensions	9503		9504	
	in	mm	in	mm
Height	5.25	133	10.5	267
Rack Depth	22.6	574	22.6	574
Overall Depth	24.5	622	24.5	622
Width	19.0	483	19.0	483
Weight ≈	lb	kg	lb	kg
Net	27	12.3	38	17.3

9504F01
FAST DATA CACHE MEMORY MODULE

Two megawords (4 MBytes). Adds 2 megawords of additional storage to one channel of the 9504 Fast Data Cache unit. Order in pairs to extend both channels by the same amount.