Signal Recorder/Playback Unit

WaveStore is a conventional personal computer that has been transformed into a low cost signal recorder/playback unit with the addition of a Red River Model 253 (*WaveRunner*) PCI transceiver. It is capable of storing long intervals of bandlimited spectrum for rebroadcast on demand. The inherent flexibility of the transceiver allows software configuration of channel parameters such as bandwidth, center frequency, sample rate, etc. Record and playback events can be scheduled days, weeks, or even months in advance.

The *WaveStore* product includes object code to C functions that constitute the record and playback utilities. User application code simply supplies a channel configuration file and activates the desired operation. The channel configuration files are generated by the *Waveformer* tool described on the back of this sheet. Simultaneous record and playback are also supported by the software.

The *WaveStore* hardware architecture is based on the SuperMicro family of dual processor Xeon servers. Several hardware options are available to tailor the unit to a particular application. The customer specifies the type of chassis, number of processors, memory capacity, disk capacity and operating system (Windows or Linux). Removable, hot swappable, and RAID disk options are also available.

Signal data is stored on disk as sequential complex samples that can be easily retrieved for off-line analysis. A single 250 Mbyte IDE disk drive is capable of storing over an hour of data at 8 MHz signal bandwidth and more than twelve hours of data received in a 1 MHz band.

The signal recorder/playback function is also available as an add-in to an existing computer. The Model 253 PCI transceiver and *WaveStore* software are sold separately for integration with any standard Intel based platform.

- ▲ Standard Windows or Linux PC Platform
- ▲ 1U, 2U, and 4U Rackmount Units
- ▲ Simultaneous Record and Playback
- ▲ Embedded Model 253 PCI Transceiver
- ▲ Baseband or 70 MHz IF Analog Interface
- ▲ Up to 8 MHz Signal Bandwidth
- ▲ Up to 8 Independent Signal Channels
- ▲ Record and Playback C Functions
- ▲ Built-In Receiver Data Time Tagging
- ▲ Record / Playback Event Scheduler
- ▲ External Interface for Synchronization
- ▲ Includes Waveformer Configuration Tool
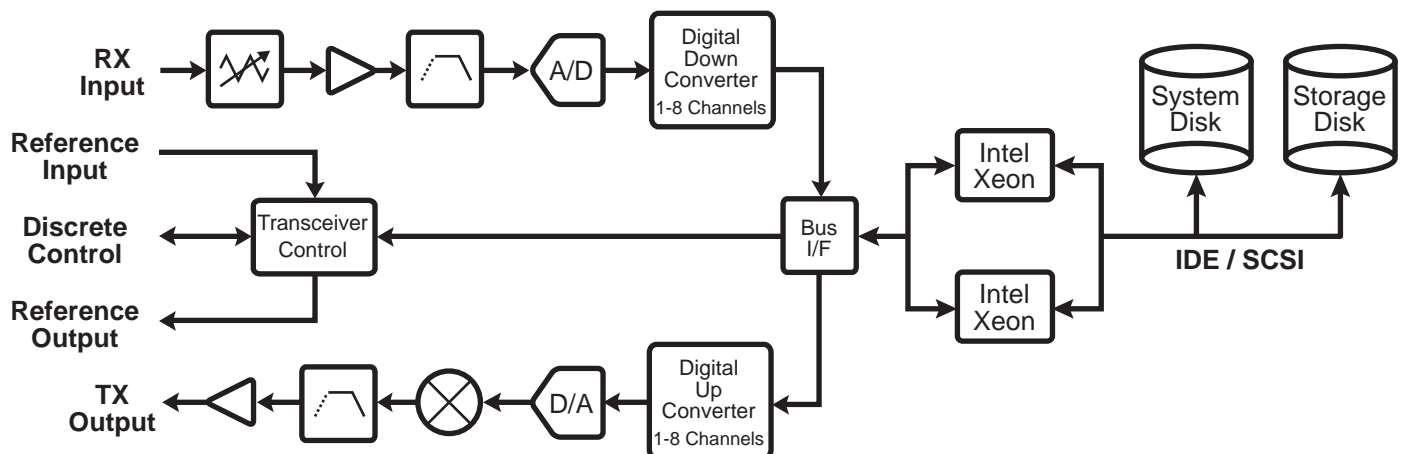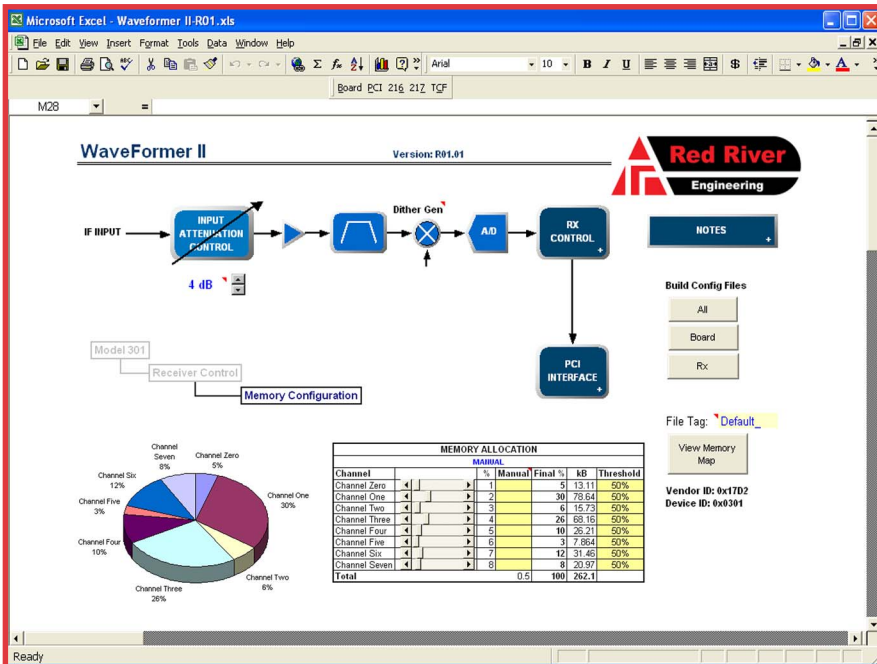
The Waveformer configuration tool simplifies transceiver programming.

The Model 253 PCI transceiver offers a wide range of operating modes that are accessible through a series of memory mapped configuration registers. The *WaveStore* software functions provide direct access to all control registers, such as the receiver input attenuator level, downconverter (ISL5216) configuration space, upconverter (ISL5217) configuration space, local command/status, and transceiver data flow control. Consult the *WaveRunner* Hardware Reference manual for further details.

Transceiver programming is simplified by the *Waveformer* configuration tool that automates the process of computing register values based on the desired performance characteristics of the receiver. The user enters configuration information through a series of menu-driven spreadsheets that accept input based on available register options. The spreadsheets also perform error checking to eliminate configuration conflicts and graphically display key performance parameters in simple block diagrams and frequency response plots. The configuration tool generates a file containing the complete memory map that is uploaded prior to a record or playback operation.

Typical Applications

▲ *Signal Intelligence (SIGINT) Collection and Analysis*

▲ *Remote Unattended Signal Recorder*

▲ *Long Duration Analog Delay Line*

▲ *Waveform Generation and Analysis*

Specification Summary

▲ Receiver
70 MHz IF Input (20 MHz BW)
-15 dBm Input Power (Full Scale)
+5 dBm 3rd Order Intercept Point
40 dB Analog Gain Control
14-bit, 56 MSPS A/D Converter
Intersil ISL5216 Downconverter
1-8 Independent Output Channels
256 kbyte Configurable Data FIFO
5 MHz Maximum Signal Bandwidth
Digital Automatic Gain Control
90 dB Linear Dynamic Range (30kHz)

▲ Transmitter
1-8 Independent Input Channels
256 kbyte Configurable Data FIFO
Intersil ISL5217 Upconverter
10 MSPS Max Complex Input
14-bit, 75 MSPS D/A Converter
5 MHz Maximum Signal Bandwidth
70 MHz IF Output (40 MHz BW)
-15 dBm Output Power (Full Scale)
+5 dBm 3rd Order Intercept Point
70 dB Spur-Free Dynamic Range

▲ Computer
Single or Dual Xeon Processors
533 MHz Front Side Bus
Up to 16 Gbytes DDR Memory
Up to 5 Free PCI-X Expansion Slots
Up to 7 IDE or SCSI Disk Drives
Dual Gigabit Ethernet Ports

▲ Options
Number of Processors
Processor Speed
Memory Capacity
Disk Capacity
Removable or Hot Swappable Drives

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