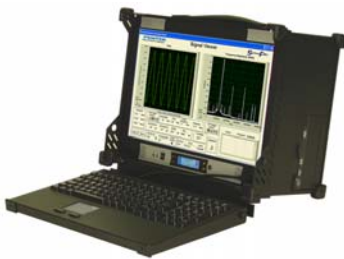


New!

# Model RTS 2721

# Portable Multiband Recording and Playback Instrument



## SystemFlow

### Features

- Portable system measuring 16.9" W x 9.5" D x 13.4" H
- Lightweight: approximately 30 pounds
- Complete high-performance Windows® workstation
- Two 14-bit 125 MHz A/Ds
- One 16-bit 500 MHz D/A
- Real-time sustained recording rates of up to 480 MB/sec
- Standard configuration with 3 TB of hot-swap storage to NTFS RAID disk array
- RAID levels 0, 1, 5, 6, 10 and 50
- Windows SystemFlow® instrument software
- Complete GUI with Signal Viewer analysis tool which includes a virtual oscilloscope and spectrum analyzer
- File headers include time stamping and recording parameters
- DDC decimation and DUC interpolation range from 2 to 32,768
- 8 kHz to 60 MHz baseband record and playback signal bandwidths
- IF frequencies to 300 MHz
- Ideal for communications, radar, wireless, SIGINT, telecom and satcom

### General Information

The Pentek RTS 2721 is a turnkey, multi-band recording and playback instrument that allows the user to record and reproduce high-bandwidth signals with a lightweight, portable package. The instrument provides sustained recording rates of up to 480 MB/sec in a dual-channel system and is ideal for the user who requires both portability and performance in a recording system.

The RTS 2721 is supplied in a small footprint portable package measuring only 16.9" W x 9.5" D x 13.4" H and weighing just 30 pounds. With measurements similar to a small briefcase, this portable workstation includes a quad-core Xeon processor, a high-resolution 17" LCD monitor, and a high-performance SATA RAID controller.

The heart of the RTS 2721 is the Pentek Model 7641-420 multiband transceiver which includes A/D and D/A converters, DDCs (digital downconverters), DUCs (digital upconverters), and complementary FPGA IP cores. This architecture allows the system engineer to take full advantage of the latest technology in a turnkey instrument.

### SystemFlow Software

Included with this instrument is Pentek's SystemFlow Recording Software. A software API is provided that allows users to integrate control of the RTS instrument into their system.

The RTS 2721 features a Windows-based GUI (graphical user interface) that provides a simple means to configure and control the instrument. Custom configurations can be stored as profiles and later loaded

when needed, allowing the user to select preconfigured settings with a single click.

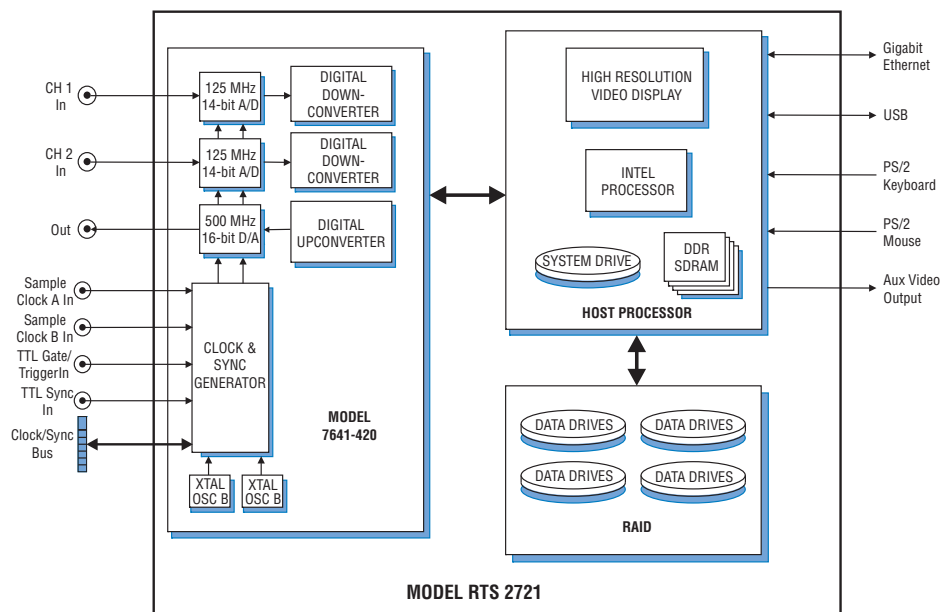
SystemFlow also includes signal viewing and analysis tools, that allow the user to monitor the signal prior to, during, and after a recording session. These tools include a virtual oscilloscope and a virtual spectrum analyzer.

Since it's built on a Windows XP Professional workstation, users can easily install post-processing and analysis tools. The RTS 2721 records data to the native NTFS file system that provides immediate access to the recorded data. Data can be offloaded via the hot-swap SATA disks, by gigabit Ethernet or USB 2.0. Data can also be copied to disk, using the 8x double layer DVD +- R/RW drive.

### Flexible Architecture

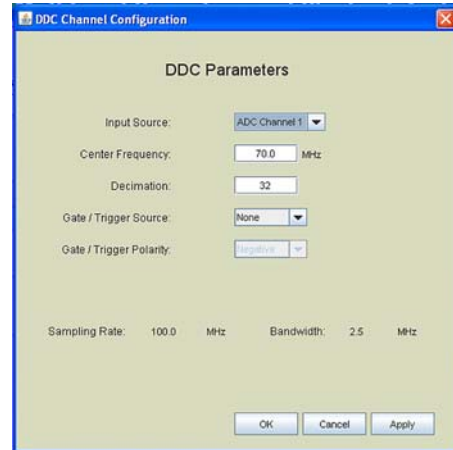
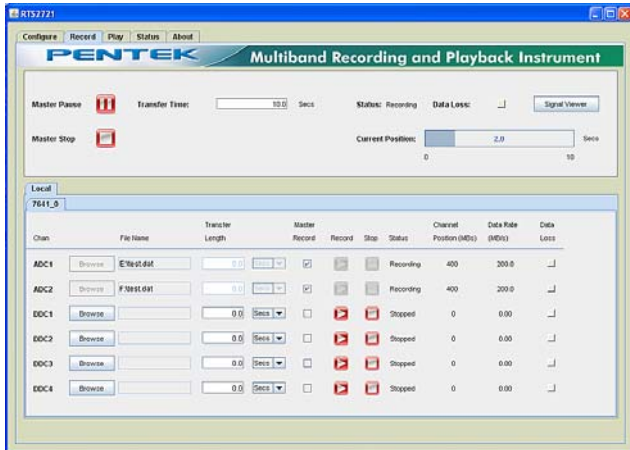
Pentek's portable multiband recorder provides a flexible architecture that is easily customized to meet the user's needs. Multiple RAID levels, including 0, 1, 5, 6, 10 and 50, provide a choice for the level of redundancy that's required. Total drive capacity is scalable up to 4.8 TB using as many as 14 hot-swap SATA drives.

The system supports simultaneous recording of one or two wideband A/D or multiband DDC channels. The analog output allows a single recorded signal to be reproduced as either a baseband or an upconverted IF signal. With its range of programmable decimation and interpolation factors, the system supports signal bandwidths from 8 kHz to 60 MHz. ➤



Contact the factory for options, for number and type of analog channels, recording rates, and disk capacity.

SystemView Graphical User Interface

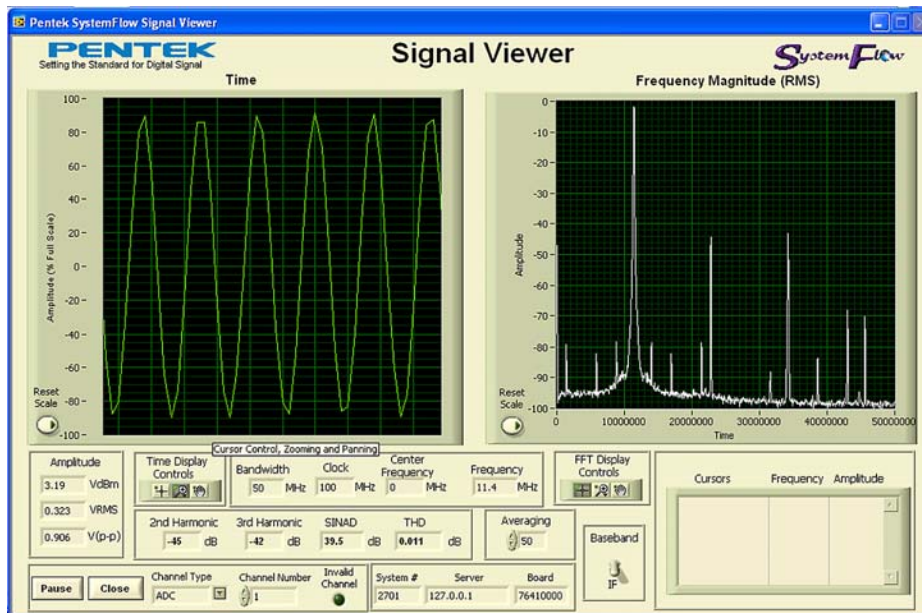


SystemFlow Recorder Interface

The RTS 2721 GUI provides the user with a control interface for the recording instrument. It includes Configuration, Record, Playback and Status screens, each with intuitive controls and indicators. The user can easily move between screens to set configuration parameters, control and monitor a recording, play back a recorded signal and monitor board temperature and voltage levels. The signal viewer, integrated into the recording GUI, allows the user to monitor real-time signals or recorded signals on disk.

SystemFlow Hardware Configuration Interface

The RTS 2721's configuration screens provide a simple and intuitive means for setting up the system parameters. The DDC configuration screen shown here, provides entries for input source, center frequency, decimation, as well as gate and trigger information. All parameters contain limit-checking and integrated help to provide an easier-to-use out-of-the-box experience.



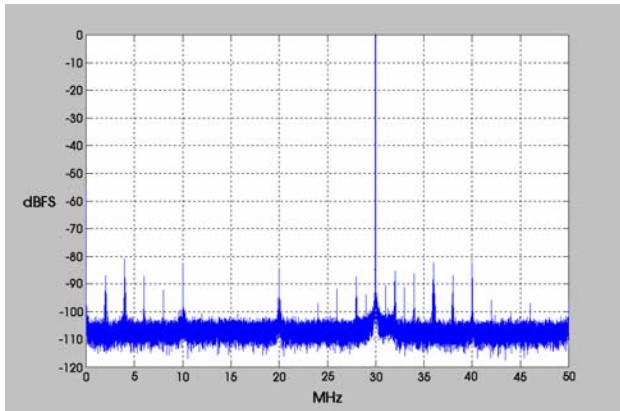
SystemFlow Signal Viewer

The SystemFlow Signal Viewer includes a virtual oscilloscope and spectrum analyzer for signal monitoring in both the time and frequency domains. It is extremely useful for previewing live inputs prior to recording, and for monitoring signals as they are being recorded to help ensure successful recording sessions. The viewer can also be used to inspect and analyze the recorded files after the recording is complete.

Advanced signal analysis capabilities include automatic calculators for signal amplitude and frequency, second and third harmonic components, THD (total harmonic distortion) and SINAD (signal to noise and distortion). With time and frequency zoom, panning modes and dual annotated cursors to mark and measure points of interest, the SystemFlow Signal Viewer can often eliminate the need for a separate oscilloscope or spectrum analyzer in the field.

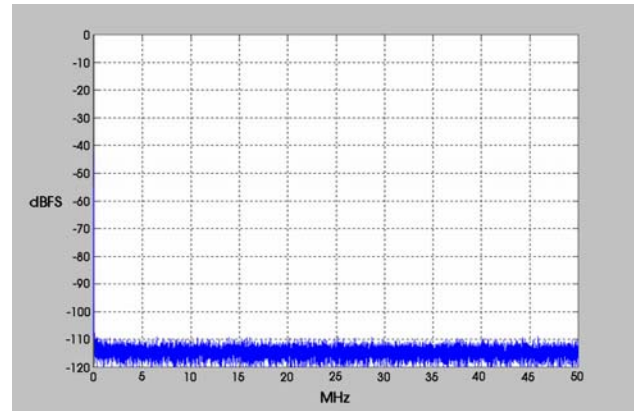
A/D Performance

Spurious Free Dynamic Range



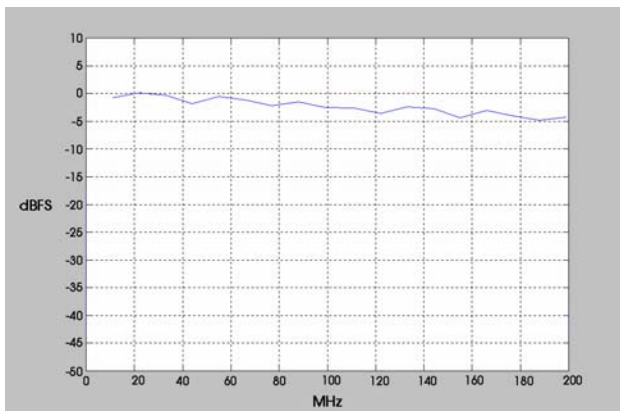
$f_{in} = 70 \text{ MHz}, f_s = 100 \text{ MHz}$

Spurious Pickup



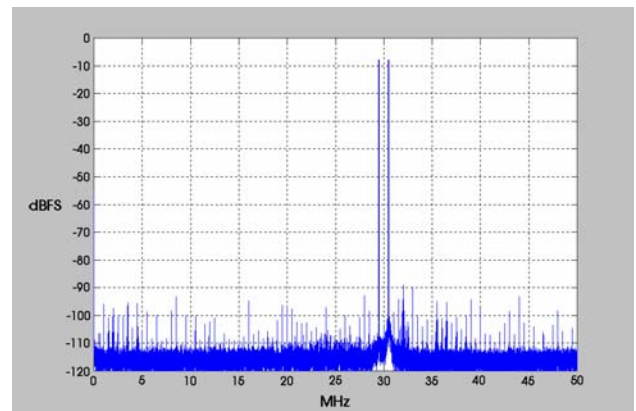
$f_s = 100 \text{ MHz}, 32k \text{ point FFT}, 8 \text{ averages}$

Input Frequency Response



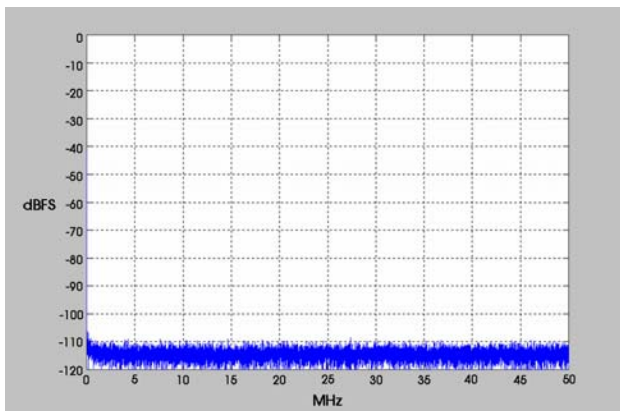
$f_s = 100 \text{ MHz}$

Two-Tone SFDR



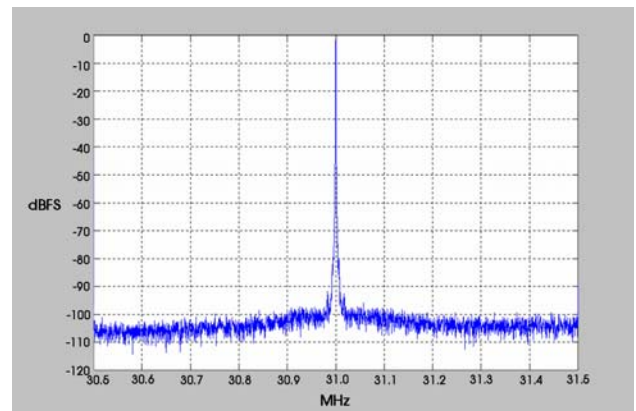
$f_1 = 29.5 \text{ MHz}, f_2 = 30.5 \text{ MHz}, f_s = 100 \text{ MHz}$

Crosstalk



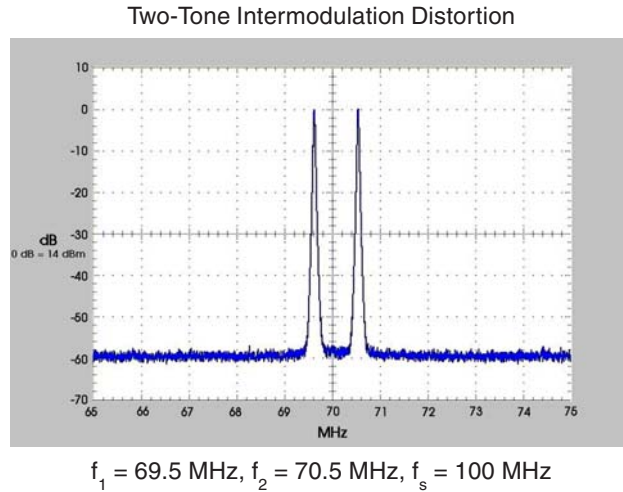
$f_{in \text{ Ch2}} = 69 \text{ MHz}, f_s = 100 \text{ MHz}, \text{ Ch 1 shown}$

Phase Noise



$f_{in} = 69 \text{ MHz}, f_s = 100 \text{ MHz}$   
Phase Noise @ 100 kHz =  $-102 - 10 \cdot \log(610) = -129.8 \text{ dB/Hz}$

D/A Performance



Specifications

PC Workstation (standard configuration)

**Operating System:** Windows XP Pro  
**Processor:** Intel processor  
**SDRAM:** 2 GB  
**Monitor:** Built-in 17" high-resolution LCD  
**RAID**

**Total Storage:** 3 TB  
**Number of Drives:** 14  
**Supported Levels:** 0, 1, 5, 6, 10 and 50

**Size:** 16.9" W x 9.5" D x 13.4" H

**Weight:** 30 lb

Environmental

**Operating Temp:** 0° to 50° C  
**Storage Temp:** -25° to 65° C  
**Relative Humidity:** 5 to 95%, non-condensing

Analog Recording Input/Output

Analog Signal Inputs

**Quantity:** 2  
**Input Type:** Transformer-coupled, front panel female MMCX connectors  
**Transformer Type:** Coil Craft WBC1-1TLB  
**Full Scale Input:** +10 dBm into 50 ohms  
**3 dB Passband:** 250 kHz to 300 MHz

A/D Converters

**Type:** Linear Technologies LTC2255  
**Sampling Rate:** 1 MHz to 125 MHz  
**Resolution:** 14 bits

Digital Downconverter

**Type:** TI/Graychip GC4016 and Pentek DDC IP Core  
**Number of Channels:** 4  
**Decimation:** 2 to 32,768  
**Bandwidth:** 8 kHz to 60 MHz

Analog Signal Outputs

**Quantity:** 1  
**Output Type:** Transformer-coupled, front panel female MMCX connector  
**Full Scale Output:** +4 dBm into 50 ohms  
**3 dB Passband:** 60 kHz to 300 MHz

Digital Upconverter

**Type:** TI DAC5686 and Pentek interpolation IP core  
**Interpolation:** 2 to 32,768  
**Input Bandwidth:** 40 MHz, max.  
**Output IF:** DC to 160 MHz  
**Output Signal:** Analog, real or quadrature  
**Sampling Rate:** 320 MHz max.; 500 MHz max. with upconversion disabled  
**Resolution:** 16 bits

**Clock Sources (2):** Selectable from onboard 100 and 200 MHz crystal oscillators, external or LVDS clocks (Option -136)

External Clocks (2)

**Type:** Front panel female MMCX connector, sine wave, 0 to +10 dBm, AC-coupled, 50 ohms, 1 to 100 MHz  
**Multi-Recorder Sync/Gate Bus:** 26-pin connector, dual clock/sync/gate input/output LVDS buses; one sync/gate input TTL signal

Specifications are subject to change without notice.

Sample Storage Configurations							
Record Mode	Number of Channels	RAID Level	A/D Sample Rate	DDC Decimation	Max. Recorded Signal Bandwidth*	Total Storage Capacity	Total Record Time
A/D	2	0	120 MHz	n/a	60 MHz	2.7 TB	90 min
A/D	2	0	100 MHz	n/a	50 MHz	2.7 TB	108 min
A/D	2	5	100 MHz	n/a	50 MHz	2.25 TB	90 min
A/D	1	0	125 MHz	n/a	62.5 MHz	1.35 TB	90 min
DDC	2	0	125 MHz	8	12.5 MHz	2.7 TB	360 min
DDC	2	5	100 MHz	32	2.5 MHz	2.25 TB	25 hr

\* For A/D outputs: Bandwidth =  $f_s/2$  (Nyquist rate); for DDC outputs: Bandwidth =  $80\% * f_s / \text{Decimation factor}$