Puma & Cougar Systems

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Revolutionizing Vibration Testing

PUMA (Cougar for portability) utilizes Spectral Dynamics' innovative *Computer-Aided Test Suite*™ (CATS) architecture. Both take full advantage of the PC's powerful Intel processor and Windows XP technology. Optimized for multi-tasking, and founded on industry connectivity and data interchange protocols, the CATS make your entire test and validation process more timely and efficient.

Versatile Test Capabilities

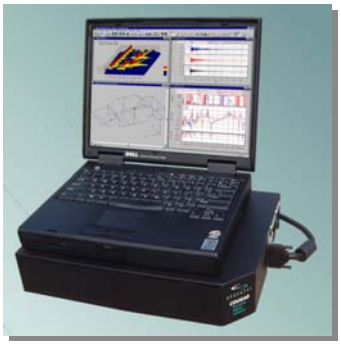
The *Computer-Aided Test Suite*™ vibration control and analysis applications were designed to meet a wide range of test requirements. With scalable hardware and software the Vibration Control and Analysis System combines the simplicity of operation required for production screening with the power and versatility required for R&D prototype testing.

- **4 to 32 input channels with ICP**
- **Powerful Multiple DSP architecture**
- **Comprehensive vibration test capabilities**
  - **Signal, Transient and Modal Analysis**
  - **Rotating Machinery Analysis**
  - **Random Control**
  - **Sine Control**
  - **Classical Shock Control**
  - **SRS Synthesis and Control**
  - **Sine on Random Control**
  - **Random on Random Control**
  - **Rotating Machinery Analysis**
  - **Road Simulation**
- **Analysis to 40 kHz with 12,800 lines**
- **Extensive laboratory integration and test automation features**
- **Scalable h/w and s/w architecture**

User Friendly

The *CATS* graphical user interface provides a user-friendly operation from setup to report preparation. Customize the interface so that it's easy to use for new and expert users. Protect against unauthorized use by setting security levels, allowing changes to the setup or test, with each user having their own security permissions. *CATS* software provides flexibility for display and analysis of data and allows seamless report generation in the Microsoft Windows XP environment.

Superior Control and Analysis



PUMA will meet the most stringent test requirements. PUMA incorporates high quality data acquisition and signal generation hardware designed with the latest floating point DSP technology with patented digital vibration control methods. ***ADAPTIVE CONTROL*** permits PUMA to "see the future" and adjust the control speed in real time to the next measure of error that is about to happen. This 'look ahead' feature allows the PUMA to control problems lesser systems don't even understand.

Networking and Test Automation

PUMA offers a wide range of options to integrate with thermal chambers and other test instrumentation. PUMA's unique client/server architecture provides unparalleled capability to automate test functions within the test laboratory. PUMA can monitor and control testing from across a local area network or the Internet. The ActiveX Automation toolkit allows users to customize their vibration control and data acquisition using Visual Basic, C++, JAVA or National Instruments LabView™.

Built By the Experts

Spectral Dynamics patented the FFT analyzer in 1968, and the digital vibration control system in 1969. Over the next eight generations of systems, SD perfected and patented industry-leading vibration system technologies. Now PUMA revolutionizes test methodology from setup to report and delivery.

CATS™
Computer Aided Test Suite

Input Subsystems	
Dynamic range	>92 dB
Analog-to-digital Channels	32 bit input channels with 16 bit programmable attenuators, 24- bit A/D converters
4 Basic; to 32 Foundation or Premier	
Amplitude accuracy	Within ±0.20% of value or ±0.03% of full scale
Amplitude linearity	±0.03% of full scale or ±0.2% of measured value, whichever is greater
Voltage ranges	Application dependent; 27 mV to 10V full Scale, in 3dB steps for Random and Shock, 12 mV to 10V full scale, in 1 dB steps for Sine
Overload detection	Full scale on all channels, analog and digital detection
Voltage coupling	AC or DC
ICP power	4 mA (20V maximum into open circuit)
Maximum rated input signal	±35 Volts peak
Sampling rate	51,200 or 102,400 samples per second
Multichannel Sampling	Simultaneous sampling on all channels-no interval
Frequency accuracy	±5 ppm
Frequency range reduction	Digital decimation and filtering using on-board DSPs
Analog Anti-aliasing filters	
Type	Filter matches 64X oversampling A/D converter
Cutoff frequency	Fixed at 225 kHz
Alias attenuation	>96dB
Passband ripple	Within ±0.10 dB
Digital	
Cutoff frequency	Variable
Stopband attenuation	>96 dB at 1.56 times cutoff frequency
Passband ripple	Within ±0.15dB
Channel-to-channel match	
Amplitude (compensated)	Better than ±0.25 dB
Phase (compensated)	Better than ±1.0 degree to 20 kHz
Crosstalk	> -90 dB below full scale
Offset removal	
Type	Digitally controlled offset rejection
Accuracy (compensated)	Better then ±0.5% of full scale, for each input range
Input impedance	1 MegaOhm shunted by <120 pf
Connector type	BNC
Connection type	Pseudo-differential, 10 Ohms to system ground, low side return
Calibration	Internal digital calibration, NIST referenced
Calibration constants	Digital calibration constants stored in nonvolatile RAM
Graphics User Interface	
Graphs	
Number per Page	Per Page to: 16 (Premier); 4 (Foundation); 1 (Basic)
Scale	Selectable Min Max and Auto Scale
Lock Properties	Thold, XMax, XMin, XScale, YMax, YMin, YScale
Default	User Defined
Setup	Default, Manual or recall from previously defined layout
Navigate	Graphical Zoom, Pan (Left/Right, Up/Down), Auto Scale, Manually adjust Min and Max values
Plots	
Number per Graph	Up to: 8 (Premiere); 6 (Foundation); 2 (Basic)
Origin	Any input or output channel (reference for cross properties) Real Time or Saved Data
Source	Channel or Location based selector
Units	Base or derived Engineering Units
Types	Time Domain or Frequency. 2D and 3D
Default	User Defined
Functions	All functions calculated by the application. Optional Function Calculator allows user to calculate his own functions. Functions operate on Real Time or Stored Data.
Cursors	XY, Peak, Peak Follow, RMS, Harmonics, Difference, Multi Peak
Real Time Markers	16 styles, 16 oer graph, manually select navigation
Real Time and Post Analysis Tags	Predefined Tags; Text Information used with Real Time Data source or Stored Data
Report Generation	WYSIWYG
	Copy Plot to Clipboard; All Spread Sheet Style Tables can be added to reports for printing

Output Subsystem	
Dynamic range	>90 dB
Digital-to-analog Channels	52 bit input channels with programmable attenuators, 16- bit A/D converters and true Analog AA Filters
Maximum output amplitude	± 12 Volts peak
Maximum output current	16 mA
Voltage range attenuator	Programmable 48-bit
Attenuator range	0 to -160dB
Attenuator step resolution	
0 to -90dB	0.05 dB
-90 to -110dB	0.10 dB
-110 to -135 dB	0.20 dB
Digital	
Cutoff frequency	Variable
Stopband attenuation	>96 dB at 1.58 times cutoff frequency
Passband ripple	Within ±0.07 dB
Output offset removal	
Type	Digitally controlled rejection of internal and external offsets
Accuracy	Better than ±0.5% of full scale
Output impedance	60ohms
Unattenuated output	Signal available on separate BNC connector
Unattenuated output level	1Volt peak, generated after analog smoothing filter
Output connector type	BNC
Output type	Pseudo-differential, 10 Ohms to system ground low side return
Output cable	Designed to drive up to 50 feet of shielded 50 ohm coaxial cable
Calibration	Automatic Internal digital calibration, NIST referenced
Calibration constants	Digital calibration constants stored in nonvolatile RAM
Computer	
Type	Intel Celeron (Foundation) or Pentium (Premier)
Operating system	MS Windows XP
CPU MHz	2.4 GHz and higher
Memory	256 MB (Basic) 512 MB (Foundation) or 1 GB (Premier)
Hard disk	80GB (Foundation) or 120 GB (Premier)
Floppy disk	1.44 Mbytes 3.5 Inch diskette
CD	Read Only (Basic); Read Write CD ROM (Foundation and Premier)
Color monitor or LCD	17, 19, or 21 inch (1280 x 1024 resolution)
Networking	Ethernet, 10BaseT connector standard
Ports	Parallel. Serial
General	
Power	
Voltage	100 to 125 Volts or 200 to 240 Volts
Frequency	50 or 60 Hz
Typical power usage	150 watts
Temperature (operating)	50 deg F to 104 deg F (10 deg C to 40 deg C)
Temperature (non-operating)	-13 deg F to 140 deg F (-25 deg C to 60 deg C)
Humidity	20% to 80% non-condensing
Maximum thermal gradient	15 deg F (8.3 deg C) per hour

> 100 Real Time Tags
User Defined Text

S P E C T R A L
D Y N A M I C S

Spectral Dynamics, Inc.
2730 Orchard Parkway
San Jose, CA 95134

TEL. 408.678.3500
FAX. 408.678.3580