CATS Classical Shock

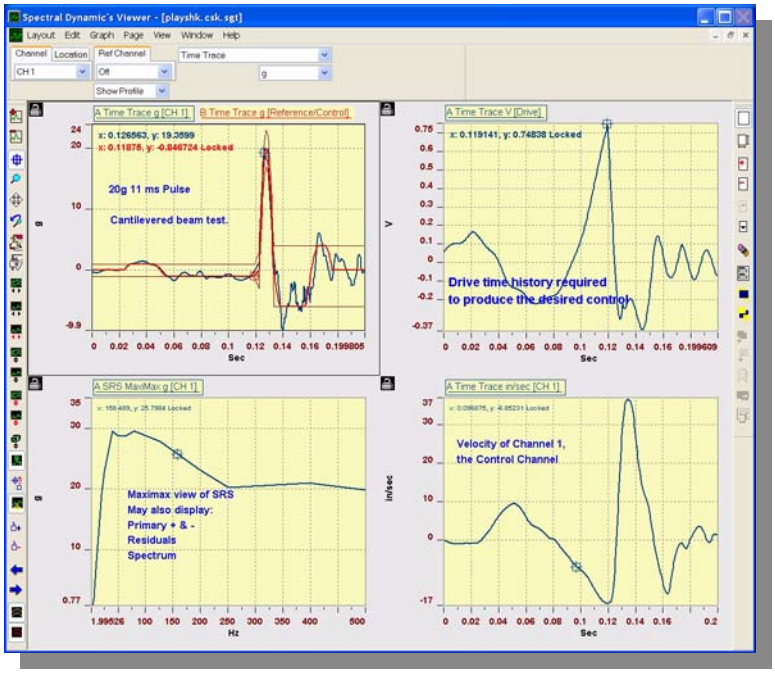

Figure 1.

CATS* Shock software employs a patented adaptive equalization technique. Not a "Once per test", amplitude only correction, but "adapts amplitude and phase" on every shock pulse to correct for non-linear conditions on both hydraulic and electrodynamic exciters.

The ability to employ true random energy for FRF Calculations provides excellent system identification.

CATS Shock provides the ability to use pulse, broadband random, or band limited random for the best system identification and accuracy.

Direct Office links with PDF creation permits fast report generation

- Pulse Types: Half-sine, sawtooth, trapezoidal, rectangular, and imported waveforms
- Belcore VERTQII seismic waveforms
- Output frames up to 16,384 samples
- SRS analysis to 10 kHz on all active measurement channels
- SRS calculation (Maxi-Max, Primary+, Primary-, Residual+, Residual-)
- Manual or automatic operation with level scheduling
- Sophisticated drive compensation management to decrease equalization time for repetitive tests

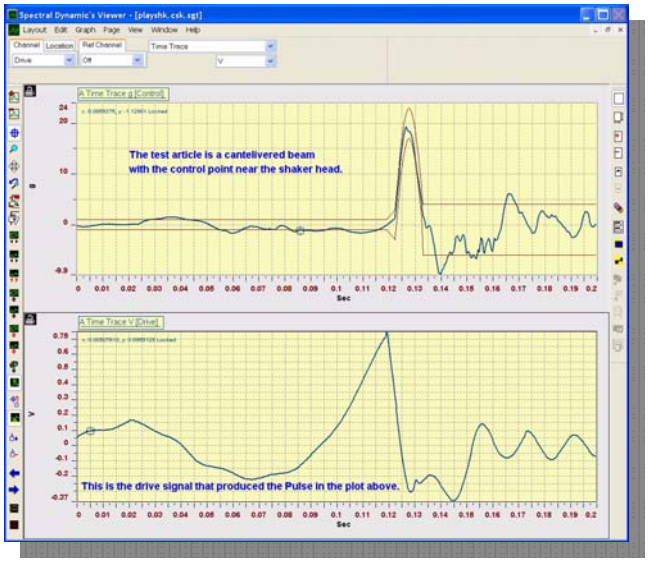

Figure 2.

CATS™ Computer Aided Test Suite

Graphics so POWERFUL, the user interface can be simple

SPECTRAL DYNAMICS

Control Methods

Control loop	Patented adaptive control algorithm with transfer function updating and coherence smoothing to accurately and quickly compensate for non-linearity or time varying changes in the dynamic load

Control Performance

Dynamic range	> 90 dB

Pulse Definition

Types	Half-sine, initial peak sawtooth, terminal peak sawtooth, trapezoidal, rectangular, import reference (UFF)
UFF Scale Factor	- 40 to + 40 dB
Pulse duration	0.1 to 32000 ms
Buffer duration	10 ms to 64 sec
Pulse amplitude	0.01 to 500 g
Rise time (trapezoidal)	0.1 to 10,000 ms
Peak time (trapezoidal)	0.1 to 10,000 ms
Fall time (trapezoidal)	0.1 to 10,000 ms
Units	g-in/s-in; g-m/s-mm, m/s^2-m/s-mm EU for Measurement Channels
Frequency range	from 50 Hz to 10 kHz; dependent on the pulse duration and type of compensation,
Frame size	Automatic selection of 512 - 8192 samples, in powers of 2 steps
Pulse dynamic limits	Maximum input voltage, max/min acceleration, max/min velocity, max/min displacement, calculated and displayed

Pulse Compensation

Type	Pre- and post-pulse, pre-pulse only, post- pulse only
Displacement optimization	(Pre- and post-pulse) Single sided, double sided
Compensation method	(Double sided) Displacement, symmetrical acceleration, non-symmetrical acceleration
Pre-pulse amplitude	5 to 100%
Post-pulse amplitude	5 to 100%
Symmetrical Compensation	5 to 100%

Display Tolerances

Type	None, MIL-STD-810, user-specified
Specified segments	+ pre-pulse, - pre-pulse, + main pulse, -main pulse, + post-pulse, - post-pulse
Specified tolerance	1 to 99%; independent for each segment

Control Parameters

Mode of operation	Manual, semiautomatic, automatic
Number of control channels	Any one channel selectable as control
Repetitive pulses	1 to 1,000,000
Delay between pulses	15 to 8,000 ms

Control Strategy

Pre-stored drive	User-selectable, No/Yes
Drive update	Off, on (equalization function updated after every pulse)
Output polarity	+/-
Weighting for averaging	User-selectable: 0.05 to 1
Feedback gain	User-selectable: 0.05 to 1
Equalization method	Transfer function
Equalization level	0 to -80 dB
Coherence Blanking	Value between 0-1
Coherence Threshold	Specified in dB
Input for equalization	Pulse, random, shaped pseudo random
Equalization Shaped Output	Octave Spacing or Linear
Non Linear Ampl. Factor	NLAF # set 0.5 to 2.0
Waveform trend removal	Disable, enable (removes DC offset before integrating from Acceleration to Velocity or Displacement).

Start-up Parameters

Initial test level	Equalization level to 0 dB
Level increment	1 to 20 dB
Equalization delay	0.0 to 8,000 ms

Safety Features

Shaker limits	Pretest verification that spectrum dynamic limits are within shaker operational limits(acceleration, velocity, displacement and voltage)
Loop check max. drive	User-selectable, 1 to 5,000 mVrms
Loop check max. noise	User-selectable, 1 to 1,000 mVrms
Max average error alarm	0.01 to 100 %
Max average error abort	0.01 to 100 %
Max peak error alarm	0.01 to 100 %
Max peak error abort	0.01 to 100 %
Control signal loss	Continuous automatic detection
Maximum drive signal	0.01 to 12V peak

Test Automation

Automatic level increase	User-selectable initial level, level increment, delay between pulses; re-equalization between each pulse
Multiple pulse	User-selectable full level pulses and delay
Print Automation	Ability to create reports Automatically with Customized displays

Channel Setup

Channel type	Control, auxiliary, inactive
Sensitivity	0.001 to 999,999 mV/g EU for Measurement Channels
Channel loop check	Enabled, disabled
Channel label	Up to 20 characters for each channel
Transducer serial number	Up to 10 characters for each channel
Transducer Database	Table Driven Archival Database
Transducer Power	Constant current source On or Off
Base Engineering Units	Label(EU), Conversion(EU/Transducer Units)
Engineering Units Calculations	Integrated (Label and Scale Factor), Double Integrated(Label and Scale Factor), Differentiated (Label and Scale Factor), Double Differentiated (Label and Scale Factor)

On-Line Analysis

Real-time analysis	Pulses and spectra for 1 to all available channels simultaneously displayed
Time functions	Control, drive, error, and auxiliary waveforms
Display units	Acceleration, Velocity, and Displacement
SRS displays	Maxi-max; Primary & Residual + or -
SRS Resolution	1/1, 1/3, 1/6, 1/12, 1/24, 1/48 Octave
SRS damping	0.1 to 99 %, user selectable
SRS definition	Absolute Acceleration, Relative Displacement
Cursors	X and Y value readout, peak search, trace tagging, multi-window locked positioning
Scaling of display	Log/linear, auto-scaled/fixed, full control

Data Storage

Data storage setup	Every pulse, last pulse, off
Playback	Scan through the entire test data file, with adjustable delay
Record annotation	Complete Tagging of each record with either static or dynamically changing info
Test summary	Fully documented post-test summary, easily printed or incorporated into any document using standard word processing software
Run message log	Text file records all system status messages displayed during test run

Repetitive Pulse Mode

Number of Pulses	1 to 1,000,000
Pulse Delay	0 to 1,000,000
Pulse Polarity	Positive, Alternating, Negative

SPECTRAL DYNAMICS

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