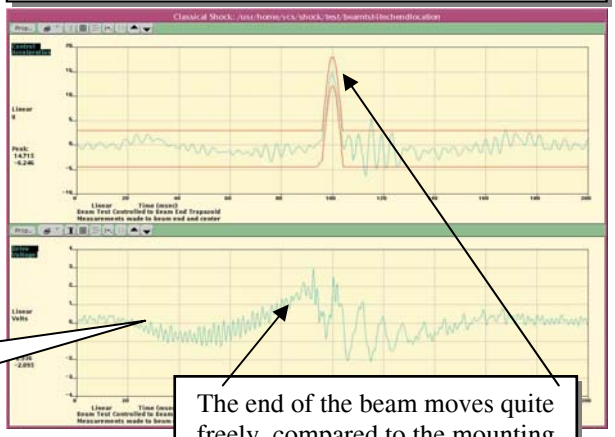
Cantilever a beam on your shaker then execute a 15g Half-Sine test. As below, set the control point to the mounting bolt location – this is an easy control problem.

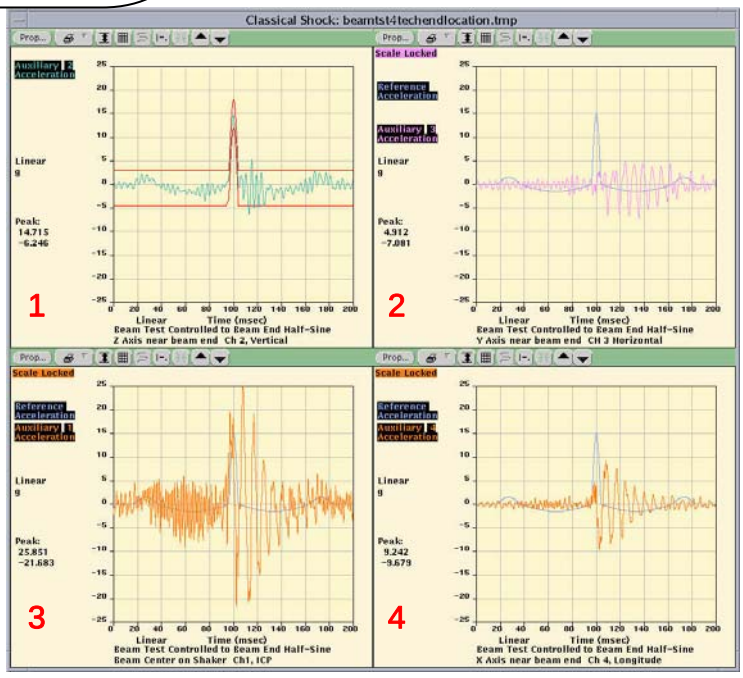
In the real world, you must control at the RIGHT location, rarely the easy one. Controlling to the beam end is more representative of real world testing. When others say it can't be done, the sound you hear is the JAGUAR getting it done!



The Drive shown above is of a well behaved system, whereas the drive to the right shows a great deal of oscillation – required to make the shaker produce the correct pulse shape

The end of the beam moves quite freely, compared to the mounting location. – The peak is correct and the test is a success!

The Control point in the graphic to the right 1 is very near the end of a beam that has been bolted to a shaker and extended over the edge approximately eight inches. This creates significant potential for displacement. The oscillation at the beam end is pronounced. Note that even the X and Y axes display significant motion, while the Z, vertical, axis is well controlled.



The graphic to the left 3shows the pulse reference with the acceleration measured at the bolt location on the shaker head. Note the extraordinary demand placed upon the shaker to ensure that the beam end met the test criteria.

If the task appears out of reach – YOU NEED A JAGUAR

SPECTRAL DYNAMICS

Control Performance

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.
Seismic methods	May import references created by the Seismic Synthesis utility option based on IEEE-344 random synthesis. See separate data sheet.
Dynamic range	Greater than 90 dB.

Waveform Definition

Types	Half-sine, initial peak saw-tooth, terminal peak saw-tooth, trapezoidal, rectangular & import reference (ASCII formatted data).
Frame size	Automatic selection of 256 to 16384 samples, in power of 2 steps (doubled internally to prevent circular convolution).
Pulse duration	Minimum 0.1 ms.
Buffer duration	10 ms to 128 sec.
Pulse amplitude	0.01 to 100,000 acceleration units.
Trapezoidal	Minimum 0.02 ms for rise, peak and fall times.
Units	g-in/s-in, g-m/s-mm or m/s^2-m/s-mm.
Frequency range	25 Hz to 10 KHz; dependent on the pulse duration, over-sample ratio & compensation.
Over-sample ratio	Selectable from 5.12, 10.24 or 20.48 times the control frequency range.
Dynamic limits	Maximum input voltage, max/min acceleration, max/min velocity, max/min displacement, calculated and displayed along with sample rate and buffer duration.

Pulse Compensation

Type	Pre- & post-pulse, pre- only, post- only.
Displacement optimization	Pre- & post-pulse: single sided, double sided.
Compensation method	Double sided: displacement, symmetrical acceleration, non-symmetrical acceleration.
Pre-pulse amplitude	1 to 100% of peak amplitude.
Post-pulse amplitude	1 to 100% of peak amplitude.

Display Tolerances

Type	User specified or MIL-STD-810.
Specified segments	± pre-pulse, ± main pulse & ± post-pulse.
Specified tolerance	5 to 100%; independent for each segment.

Control Parameters

Mode of operation	Manual, semi-automatic or automatic.
Number of channels	Any one channel selectable as control. All other (up to 97) selectable for auxiliary measurements.
Repetitive pulses	1 to 1,000,000.
Delay between pulses	0 to 1,000,000 ms.

Control Strategy

Pre-stored drive	User selectable (may verify before test start).
Drive update	Equalization function updated after every pulse or may override.
Output polarity	Selectable as positive or negative (±).
Weighting for averaging	Selectable from 0.05 to 1.
Feedback gain	Selectable from 0.05 to 1.
Equalization method	Frequency response transfer function - H(f).
Equalization level	-30 dB to 0.0 dB (full level).
Equalization signal	Pulse or random.
Waveform trend removal	May remove offset before integrating from acceleration to velocity or displacement.

Start-up Parameters

Initial test level	Equalization level to 0.0 dB
Level increment	0.1 to 10 dB.
Delay between pulses	0.0 to 1,000,000 ms.

Safety Features

Shaker limits	Pretest verification that dynamic limits are within shaker operational limits (acceleration, velocity, displacement and voltage).
Loop check drive	Selectable maximum from 10 to 3300 mVrms.
Average error alarm & abort	Selectable up to 500%; normalized to the peak value of the Reference.
Peak error alarm & abort	Selectable up to 1000%; normalized to the peak value of the Reference.
Control signal loss	Continuous automatic detection.
Maximum drive signal	Selectable from 0.01 to 10 V peak. Outputs not allowed above this level.

Test Automation

Automatic level increase	Selectable initial level, level increment, delay between pulses; re-equalization between each pulse.
Multiple pulses	Selectable number of full level pulses & delay between pulses.

Channel Setup

Channel type	Control, auxiliary or inactive.
Coupling	Select DC or ICP with 24V supply.
Sensitivity	0.01 to 10,000 mV/g or $mV/(m/s^2)$.
Loop check	Select enable or disable for each channel.
Channel labels	Up to 45 characters (2 labels each channel).

On-Line Displays

Simultaneous displays	Up to 12 windows, each with up to 4 grids.
Waveforms per grid	Up to 4 (up to 192 on 48 grids).
Auxiliary monitor	Optional second monitor for test displays.

On-Line Analysis

Real-time analysis	Time histories, FFT spectra & SRS types simultaneously displayed for all channels.
Time histories	Control, drive, reference, error and auxiliary.
Integration	Velocity & displacement computed from acceleration.
SRS displays	Maxi-max, Primary +, Primary -; with tolerance bands; tabular list of SRS frequencies and acceleration values.
Drive displays	Voltage & spectrum for most recent drive and next drive (output).
Cursors	X and Y value readout, peak search, trace tagging, multi-window locked positioning.
Scaling	Log or linear. Auto-scaled or fixed.

Data Storage & Review

Setup & format	Automatically store every pulse, every full level pulse or manually via Save button. Binary files easily converted to UFF and Matlab formats and easily transferred to PC via network, CD, floppy or flash disk.
Playback	Scan forward or backward through the entire test data file, with adjustable delay.
Annotation	Test name, test time & test level for each record.

Documentation

Test summary	Fully documented post-test summary, easily printed or incorporated into any document using standard word processing software.
Message log	Text file records all system status messages displayed during the test.
Automatic & batch plots	Automatic plot generation at test completion. Plot modes for sending all displays to the printer with single or multiple grids per page. Automatic conversion to UFF and Matlab formats at end of test.

SPECTRAL DYNAMICS

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