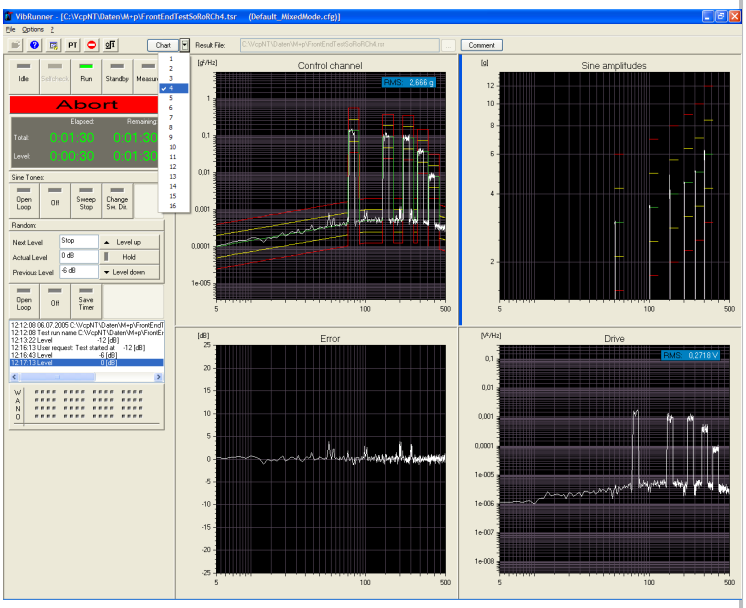
VibControl

Mixed Mode Testing

The Mixed Mode add-on modules for the Random Vibration Control Software allow tests to run with sine tones and/or narrowband random signals superimposed on a random background. Mixed mode testing is a complex control task, and VibControl supports three modes: Sine-on-Random (SoR), Random-on-Random (RoR) and Sine-on-Random-on-Random (SoRoR). Gunfire burst control can also be superimposed in each case.

Key Features

- SoR and RoR control are fully compliant with DIN, MIL-STD 810 and other standards
- Support on electrodynamic and hydraulic shakers
- Up to 20 independently sweeping sine tones and/or 25 narrowband random signals overlaid onto a random background
- Each sine tone/narrowband with its own profile and limits
- Time offset and automatic timed toggle on/off for each individual sine tone/narrowband
- Gunfire burst simulation
- Overlapping of the sine tones/narrowbands
- Accurate control thanks to independent sine tone generators and digital tracking filters



Applications

- Tracked and wheeled vehicle vibration (helicopter, turbo jet aircraft, automotive power train), trains, agriculture vehicles
- Machine gunfire simulation

Control Modes

In Sine-on-Random (SoR) mode, up to 20 independently sweeping or fixed sine tones are combined with a random background for advanced qualification and developmental test applications, e.g. for automotive power train, gunfire and helicopter simulation. Independent sine tone generators and a combination of bandpass and bandreject filters ensure accurate control which is independent of random signal parameters. Each sine tone may have its own profile (frequency, acceleration, velocity, displacement) and limits. The tones, which may cross, can sweep at different rates and directions. Time offset and automatically timed on and off sequences of the sine tones replicate gunfire bursts.

Random-on-Random (RoR) mode enables up to 25 independently sweeping or fixed narrowband random signals to be overlaid onto a background random spectrum. RoR is used, for instance, for simulating military tracked vehicles. Each sweeping narrowband may have its own profile (PSD amplitudes) and limits. The narrowbands can sweep at different rates and directions and also can overlap. If required, the user specifies rates at which the narrowbands are switched on/off as well as relative offsets.

Sine-on-Random-on-Random (SoRoR) mode represents the ultimate in vibration control testing and combines Sine-on-Random with Random-on-Random testing. Up to 20 sweeping sine tones and up to 25 sweeping narrowbands are superimposed on random background to simulate complex vibrational environments such as machine gunfire on tracked vehicles or ABS simulation on cars and trucks. Each sweeping sine tone and each narrowband may be specified with its own profile and limits.

Test Set-Up & Test Run

The Mixed Modes have the complete functionality of a Random test run including system selfcheck, manual controls, which may be disabled, and a date and time stamped test log. In addition, test mode specific functions are available, e.g. turning on/off the sine tones or narrowbands with the ramp time defined, stopping the current sweep and changing the sweep direction. The advanced data review and report program allows reports to be printed directly from the control window, alternatively the displayed data can be copied to standard Windows applications such as Word or Excel. Plots can be created with single or overlaid traces. User comments, company logos and graph markers can all be added to create a complete report ready display. Data filtering is available to quickly select the most relevant data from all that was stored during the test.

Sine-on-Random (SoR) Set-Up

- Up to 20 independently sweeping and/or fixed sine tones can be overlaid onto a background random spectrum
- Specification of random signal as per random mode
- Specification of each sine tone as per swept sine mode
- Each tone may have its own profile (frequency vs. acceleration or velocity or displacement) and limits
- Sine tones each have their own start and end sweep frequencies
- Tones can be toggled on and off at user-defined rates with relative time offsets
- Sine tones can sweep at different rates and directions
- Overlapping of sine tones
- Independent sine tone generators and a combination of band pass and band reject filters ensure accurate control which is independent of random signal parameters
- Overall test level schedules are as per random mode

Random-on-Random (RoR) Set-Up

- Up to 25 independently sweeping and/or fixed narrow random bands can be overlaid onto a background random spectrum
- Specification of random signal as per random mode
- Each narrowband may have its own profile (frequencies vs. PSD amplitudes) and limits
- Narrowbands have each their own start and end sweep frequencies and frequency bandwidths
- Narrowbands can be switched on and off at user-defined rates with relative offsets
- Narrowbands can sweep at different rates and directions
- Add mode adds the narrowband amplitude to the background amplitude spectrum. Max. mode envelopes the narrowband amplitude and the background amplitude spectrum.
- Overall test level schedules are as per random mode

Sine-on-Random-on-Random (SoRoR) Set-Up

- Combination of Sine-on-Random and Random-on-Random testing (see specifications above)

Post-Processing & Reporting

The reports can be generated online while running a test or upon test completion. The ultimate step in electronic report generation is using the SO Analyzer e-Reporter software package to which the VibControl data can be directly exported.

Post-Processing

- Transfer function: Relating the behaviour of control and measurement channels in the test run
- Mathematical functions: Converting the measured acceleration signal into velocity and displacement, or vice versa
- Peak value analysis: Peak values will be marked automatically in the graphics and listed with their numerical data in a table
- Graphical and Numerical Measurement and Reference Data Analysis:
  - Control and response spectra with reference, alarm, abort and notch limits
  - Sine tones with alarm, abort and reference profile
  - Error
  - Drive
  - Coherence
- Printouts
  - Multiplot: Displaying and printing several traces in one graphic
  - Autoplot: Automatically printing a preselected series of graphics
  - Printing a list of preselected test parameters
  - Printing directly to MS Word using a customer defined template

Reporting

- Interface to m+p international's SO Analyzer e-Reporter software for comprehensive analysis and reporting
- One click printing to a Word document of all or a selection of result data
- Copy and paste of all or a selection of result data to Excel for matrix analysis

Operating System
- Microsoft Windows 2000/XP

Ordering Information
- VC-SOR Sine-on-Random
- VC-ROR Random-on-Random

Optional VibControl Software Modules
- VC-RAN Random
- VC-RNO Random Notching
- VC-SIN Sine
- VC-SNO Sine Notching
- VC-SRD Sine Resonance Search & Dwell
- VC-SRE Sine Reduction
- VC-SRT Sine Reduction – Throughput
- VC-RRE Random Reduction
- VC-RRT Random Reduction – Throughput
- VC-DCO Displacement Control
- VC-CLS Shock Classical
- VC-SRS Shock SRS
- VC-EXP External Pulse
- VC-TRC Transient Capture
- VC-TRT Transient Capture – Throughput
- VC-RLD Time Domain Replication (e.g. Road Load)
- VC-CRT Crash Test
- VC-ACO Acoustic Control
- VC-MOC Momentum Control
- VC-HFS High-Frequency Sine
- VC-APP Advanced Post-Processing
- VC-SVU VibUtil
- VC-AVU Advanced VibUtil
- VC-RSC Multi-Monitor
- VC-VBM Visual Basic Module
- VC-NOF VibCo Pilot (No Frontend Licence)
- VC-CAL VibCalibrate

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