

PRODUCT DATA

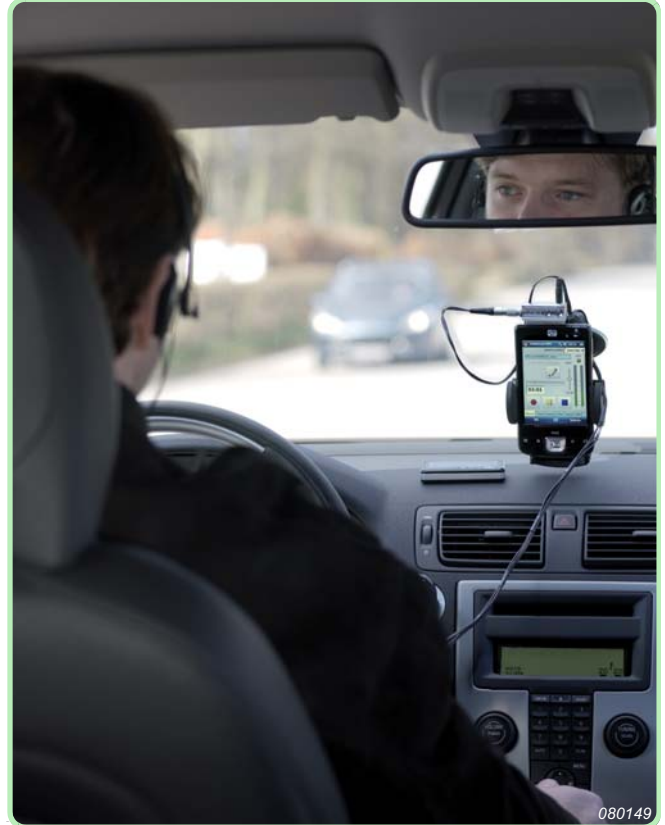
SoNoScout NVH Binaural Recording and Analysis System — Type 3653-A

SoNoScout NVH Type 3653-A is a focused automotive NVH tool for two-channel sound data acquisition and analysis. SoNoScout is highly portable, versatile and very easy to use. For maximum recording flexibility, the system provides phantom or ICP® power and optionally can record digital signals direct. For simultaneous recording of audio and positional data, a GPS unit is included.

The system is ideal for use in any situation where it is impractical or impossible to attach a transducer (or tachometer) to a vehicle.

The entire SoNoScout NVH system is contained in one rugged transport case, and the main components are compact enough to be carried in a coat pocket. SoNoScout's high portability enables you to obtain data anywhere – from road testing a competitor's vehicle to field testing in order to quantify customer complaints.

SoNoScout NVH is also ideal for obtaining data for use with PULSE™ NVH Vehicle Simulator Type 3644. SoNoScout NVH simultaneously records audio and vehicle performance data, which can be processed into NVH Vehicle Simulator models, and GPS data from which visual scenarios can be automatically generated.



Uses and Features

Uses

- Record binaural sound or two channels of vibration/audio for NVH development applications, such as confirming prototype/design performance changes
- Record competitor vehicles for reference or processing into simple NVH Simulator models
- Map roads and test tracks for inclusion as custom scenarios in NVH Simulator using Road Creator
- Capture vehicle behaviour during on-road evaluation or while using On-Road Simulator
- Record, at the dealership, vehicle sounds or vibrations that are the subject of customer complaints for subsequent identification and fault finding
- General purpose two-channel data recorder with replay and fundamentals of analysis, with GPS as meta-data

Features

- Easy-to-use and compact design
- Record two channels of sound or vibration, with instant replay of recorded signals for validation (file formats: Calibrated wave or HDF)
- Analogue inputs (Phantom, DeltaTron/ICP and line level)
- Optional digital inputs
- GPS for vehicle speed and position
- Engine RPM estimation from signal channels
- 2D and 3D spectral displays with 2D reference curves
- Order analysis
- Simple metrics (Overall, Band, Articulation Index, etc.)
- Basic filtering
- PC version (analysis only) of the software is included for greater convenience in post-processing

Description

Fig. 1
Complete SoNoScout
NVH contents
Insert: Main
components held in
one hand



SoNoScout NVH is an ultra-compact, easy-to-use, PDA-based, two-channel data-acquisition and post-analysis package (Fig. 1). The system is fully contained in a rugged travel case, and the main components are compact enough to fit in a coat pocket.

In order to maximise flexibility, the system comes with both an analogue sound card, which is connected to the included headset (headphones and microphones), and a Dual DeltaTron Supply Unit WB-3553, which enables connection to DeltaTron (ICP) powered measuring devices. A digital input card is optionally supplied. The recorded data are stored on an SD memory card.

Types 3653-A-JP and 3653-A-US

Types 3653-A-JP and -A-US provide the same features and functionality as Type 3653-A but have been tailored to meet the Japanese and United States requirements, respectively. The remainder of this Product Data refers to all three types unless specifically stated.

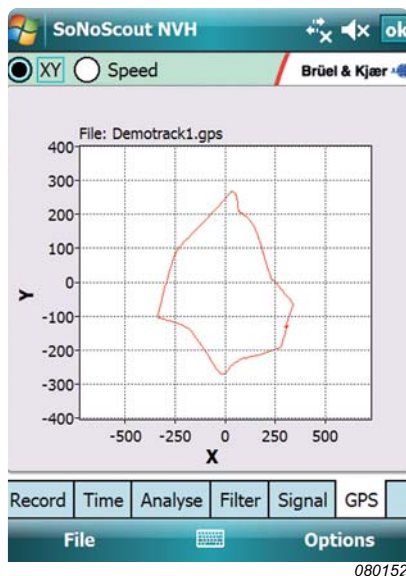
Functionality

SoNoScout NVH provides user-definable capabilities throughout the entire data acquisition process, before, during and after recording.

Before Recording

Before beginning the session, you can set up the system according to the sound card and GPS device, calibrate the microphones or accelerometers, define default meta-data for recorded sound files and define the file storage folder on the SD card.

Fig. 2
SoNoScout NVH
displaying GPS data



During Recording

During the recording session, SoNoScout NVH provides you with a level meter with overload warning, gain control, and the ability to set event markers and store a time-history file. There are also auto-filename, pre-trigger and auto-stop features. Data can be stored in calibrated wave or .hdf format.

GPS

SoNoScout NVH enables you to record and view GPS information synchronised to the audio recording. These data provide vehicle speed information sufficient for modelling vehicle performance in NVH Simulator Type 3644. SoNoScout NVH also records positional information suitable for conversion into scenarios for NVH Simulator by optional Road Creator software. The GPS file is edited (e.g., trimmed) simultaneously with the sound file to maintain synchronisation.

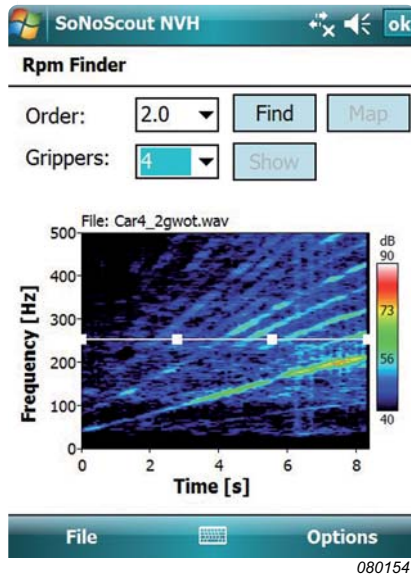
After Recording

SoNoScout NVH offers several post-processing options. You can review, listen to and edit the recorded time history, display speed or RPM-time curves, or analyse the data with one or more of the provided tools.

Analysis

SoNoScout NVH provides you with a variety of quick and intuitive analysis tools (such as a 2D spectrum and 3D map, autospectrum and power spectral density (PSD), narrow band and 1/3-octave, and Lin and A-weighting). User-definable reference curves can be overlaid on 2D spectra. Linear and Log displays are included.

Fig. 3
On-site analysis of a section from the Time display (top) and RPM Finder (bottom) being utilised



Order Analysis

You can display any two orders or an order plus overall level on a time, RPM or frequency axis.

RPM Finder

You can quickly and easily obtain RPM data. RPM Finder calculates RPM from the spectral content of a recording. This lets you record vehicle data for NVH analysis without any contact with (or instrumentation mounted to) the vehicle in cases of time or permission constraints. After calculation, RPM Finder embeds the RPM and vehicle speed from the GPS recording in the 16th bit of the sound recording.

Modification

SoNoScout NVH also provides a filtering tool that enables you to apply a user-selectable combination of notch (either at a constant frequency or locked to RPM), high-pass and low-pass filters. After the filter has been applied, you can compare the original and filtered analysis results and listen to their sounds back to back.

SoNoScout also enables easy normalisation of wave files or conversion to a user-definable calibration level for optimal export to non-calibrated replay systems.

Analysis on a PC

An analysis-only version of the software, which runs on a PC, is also included in order to allow more convenient data analysis.

Compliance with Standards

	<p>CE-mark indicates compliance with: EMC Directive and Low Voltage Directive. C-Tick mark indicates compliance with the EMC requirements of Australia and New Zealand.</p>
<p>Safety</p>	<p>EN/IEC 61010–1 and ANSI/UL 61010–1: Safety requirements for electrical equipment for measurement, control and laboratory use.</p>
<p>EMC Emission</p>	<p>EN/IEC 61000–6–4: Generic emission standard for industrial environments. CISPR 22: Radio disturbance characteristics of information technology equipment. Class A Limits. FCC Rules, Part 15: Complies with the limits for a Class A digital device. This ISM device complies with Canadian ICES-001 (interference causing equipment standard). Warning: This is a Class A product. In a domestic environment, this product may cause radio frequency interference that may require the user to take adequate measures.</p>
<p>EMC Immunity</p>	<p>EN/IEC 61000–6–1: Generic standards – Immunity for residential, commercial and light industrial environments. EN/IEC 61000–6–2: Generic standards – Immunity for industrial environments. EN/IEC 61326: Electrical equipment for measurement, control and laboratory use – EMC requirements. Notes: The above is only guaranteed using accessories listed in this Product Data sheet and when powered by battery. This unit may be sensitive to electrostatic discharge and RF.</p>

For environmental specifications and compliance with standards for PDA and accessories, see the specifications given by their respective manufacturers.

Specifications – SoNoScout NVH Type 3653-A

Microphones

Cartridge Type: Prepolarized, gold-plated condenser element with vertical diaphragm

Microphone Size: 12.7 mm (0.5 in.) length, 5.4 mm (0.21 in.) capsule diameter

Frequency Range: 20 Hz – 8 kHz, ± 2 dB re 1 kHz, 3 dB soft boost at 8 – 20 kHz when measured in free field for individual microphones at 0° incidence

Sensitivity: Nominally 20 mV/Pa ± 3 dB at 1 kHz

Equivalent Noise Level, A-weighted: Typically 23 dB(A) re 20 μ Pa

Maximum Sound Pressure Level: 134 dB SPL before damage

Total Harmonic Distortion: <3% at 114 dB SPL (sine)

Preamplifier Output Impedance: 30 – 40 Ω

Cable Drive Capability: Up to 3 m (10 ft.)

Cable Length: 1.40 m (4.6 ft.) from capsule to connector

Weight: <10 g (down to cable clip)

Dual DeltaTron Supply Unit – WB-3553

Setup: SoNoScout/Options/Allocate Channels: WB-3553 should be selected (Phantom Supply = 48 V)

These specifications show typical data unless otherwise stated

INPUTS

Connector Type: 10–32 UNF (μ -dot) single-ended

DeltaTron Current: Both channels: 3 mA from a +24 V voltage source

Max. Input Signal: 3.16 V RMS or 4.47 V peak

Input Impedance (s.e.): Approx. 14 k Ω ||150 pF

OUTPUT

Connector Type: LEMO series FGG.0B.305.CLAD42 (5-pin, transferring differential signals for left and right channels)

Frequency Range: 20 Hz – 20 kHz ± 1 dB (incl. Maycom CF Audio Card)

Feed-through Damping: 0.06 dB (with 50 Ω source at input)

Inherent Noise: <6 μ V (20 Hz – 20 kHz and 50 Ω source at input) corresponding to 5 μ V (A-weighted)

Output Impedance: 15 Ω (at 10 kHz) in series with 22 μ F in each branch of the differential output

Cross-talk: <–90 dB at 10 kHz (with 50 Ω source at input)

Distortion: 0.02% THD at 1 kHz, 0.08% THD at 5 kHz (Max. input signal)

POWER SUPPLY

Current Consumption: 4 mA (each channel) from a 48 V Phantom Supply

DIMENSIONS

Length: 60 mm (2.36")

Width: 24 mm (0.94")

Height: 12.5 mm (0.49")

SoNoScout NVH Case

(with system components stored inside)

Dimensions

164 \times 322 \times 450 mm (6.5 \times 12.7 \times 17.7 in.)

Weight

4 kg (8.8 lb.)

PDA and Accessories

See respective manufacturer details for the specific model information included in the package.

Ordering Information

Type 3653-A SoNoScout NVH Binaural Recording & Analysis System

Type 3653-A-JP SoNoScout NVH Binaural Recording & Analysis System, Japan

Type 3653-A-US SoNoScout NVH Binaural Recording and Analysis System, United States

include the following software and hardware:

- KE-4323: Transport Case
- DZ-9832: In-car Holder plus Mounting Bracket for PDA
- HT-0021: Headset
- MM-0343: Binaural Pair of Microphones
- UL-0248: HP iPAQ PDA
- ZZ-0257: Bluetooth® GPS Unit (Types 3653-A and 3653-A-US)
- ZZ-0257-JP: Bluetooth® GPS Unit for Japan (Type 3653-A-JP only)
- ZG-0464: Travel Adaptor plus Kit Including USB Cable
- ZG-0465: Car Charger
- UL-0246: Analogue Compact Flash Sound Card
- WB-3553: Dual DeltaTron Supply (Phantom powered)
- DS-1134: Foam Insert
- DP-0978: Calibrator Adaptor for Binaural Microphone Type 4101
- 2 \times UL-0245: SD Card (2 GB)
- BZ-5634: Software USB Stick
- VP-0648: License Dongle

OPTIONAL ACCESSORIES

UL-0247	Digital Compact Flash Sound Card
JP-0747	RCA-to-Mini-jack Adaptor
JP-0748	Optical Adaptor
Type 4231	Sound Calibrator
Type 4294	Calibration Exciter
Type 4507	Miniature Deltatron Accelerometer
DV-0459	Calibration Clip (for Type 4507)
AO-0706	Adaptor Cable from Headphone Microphones to CCLD

OPTIONAL SOFTWARE

Type 3644-A	Desktop NVH Simulator, Jury and Engineering*
Type 3644-B	Desktop NVH Simulator, Jury only*
Type 3644-C	Desktop NVH Simulator, Engineering only*
Type 8601-M-N	DTS RoadCreator*
Type 8601-N-N	DTS On-Road Simulator*

Service

TRACEABLE CALIBRATION

3653-CTI	Initial Traceable Calibration
3653-CTF	Traceable Calibration

* For information on included and optional hardware and software for these items, see Product Data BP 2109.

TRADEMARKS

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