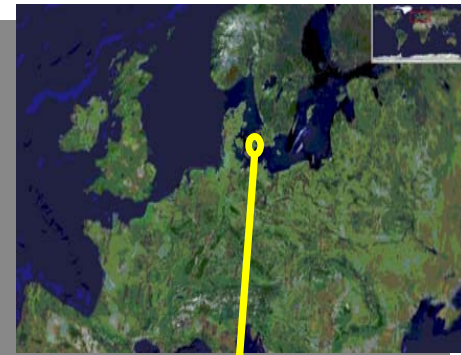


Checking NVH Variability of Production Vehicles



WebEx
21 February 2007

10:00 CET
&
16:00 CET



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To hear the sound:

Use headphones or loudspeakers
connected to PC
(sound via Voice over Internet Phone -
VoIP). Listening only.

To join Internet Phone:

You will be prompted when the host has started the
conference. Just click yes.



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- Different approaches to NVH testing in quality assurance
- Preparing the Test
- Test Execution
- Reporting
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- Summary



Support from R&D

- Fly in test engineers from platform team to do Quality assurance and/or trouble-shoot problems on site
- + The experts are on – site
- + Complex tests can be done
 - Expensive
 - Test engineers are busy validating pre-production prototypes (high priority)



Use advanced NVH test system

- Validate overall NVH performance through multi – channel test
 - Example
 - » 4 microphones (one per seat position)
 - » Tri-axial accelerometer on steering wheel
 - » Tri-axial accelerometer on driver's seat rail
 - » Engine -, wheel tachos
 - » Other....
- + more complete benchmark test
 - larger investment in equipment & training
 - Longer set-up time



Simple one point noise validation test

- Use the Type 2250 handheld Analyzer to monitor the cabin noise variability without support from platform teams
-
- + Easy, safe, fast:
 - set-up
 - data acquisition
 - reporting
 - local language user interface
-
- + cost effective solution:
 - low price
 - short learning curve
 - One test position at a time



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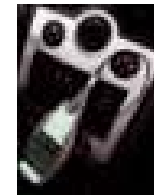
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Preparing the Test - 1

- Decide what type of test, that needs to be done (examples):
 1. 20 sec LAeq (A-weighted)
 2. 20 sec Leq 1/3 Octave (1/1 Octave) analysis (A-weighted), 6.3 Hz or 12.5 Hz to 20kHz
 3. Both 1. And 2.
 4. Time recording in parallel for later analysis
 5. Save settings in template

Mic extension cable



- Fit the Type 2250 Analyzer microphone through 3 m extension cable

Calibration



- Calibrate the Type 2250 Analyzer

- Carry system to the test track

Carrying bag/ rucksack
Also room for laptop, papers etc



Preparing the Test - 2

- Place analyzer & microphone in the vehicle
 1. Mount analyzer on device, that is attached to the windscreen, **or**
 2. Place analyzer between the front seats
 3. Mount the microphone/ preamplifier in reference position in a jig, **or**
 4. Use Binaural Microphone
 5. Switch on the Analyzer and start the vehicle



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Test Execution

Drive the vehicle at the pre-described test condition
(ex. fixed speed, 50 km/h)

1. The test...

1. Ready

Slow flashing:



Ready

2. Press “start” to start measurement

Steady:



Measuring

3. Result is monitored during the test

*High contrast display visible also in bright sunlight
120 dB dynamic range. No auto-ranging needed*

4. Measurement stops automatically when test time has elapsed

Fast flashing:



Done

5. Press “Save” to save measurement/recording

Data saved on removable media (SD, CF cards)

6. Add voice annotation if anomalies during test need to be reported



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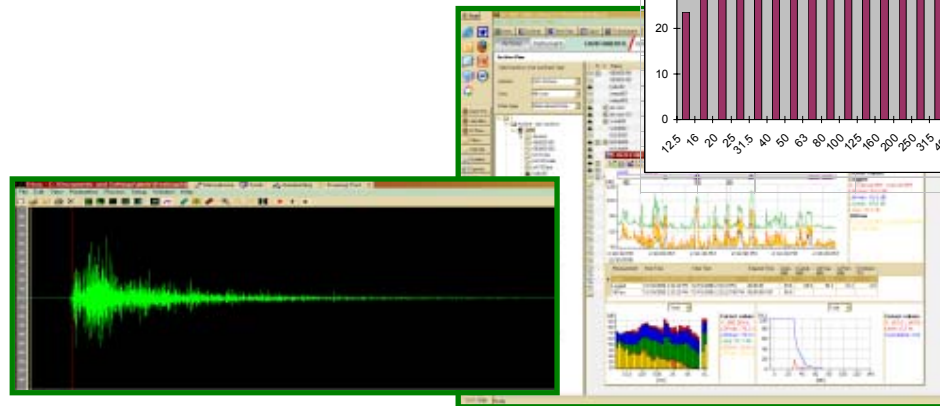
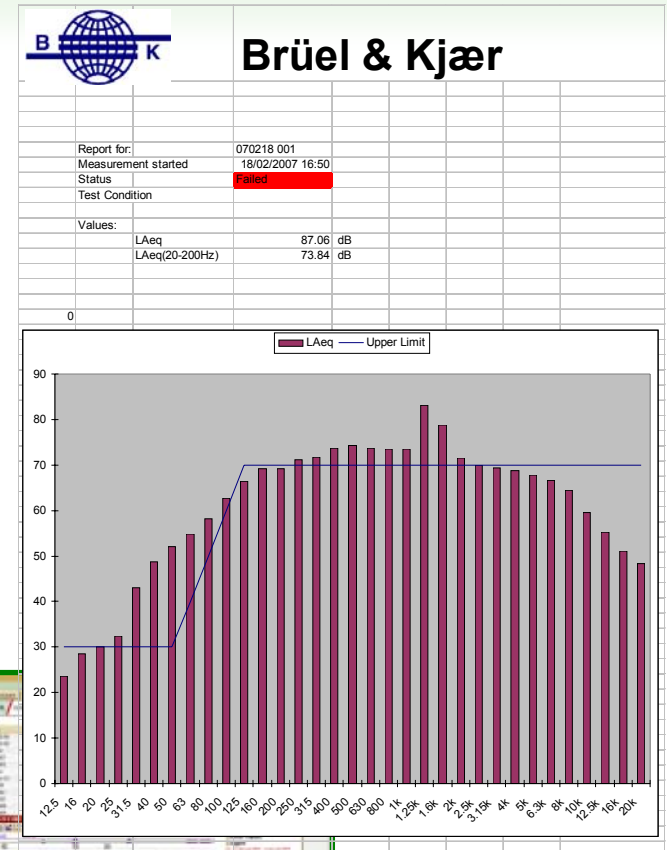
Reporting

1. Reporting

1. Note dBA level on prepared report paper, and/or
2. Place memory flashcard in laptop after test and do report in office
3. Listen to voice comments and type them into the report as needed

2. Time recording

1. Mail optional time data recording as .wav file to platform team for further analysis if needed



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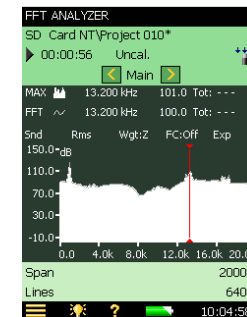
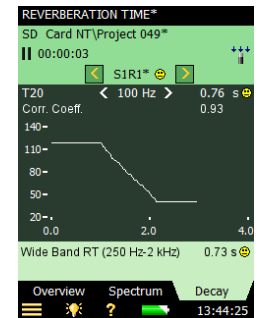


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Other applications in Automotive testing

- Check of Pass By levels
 - Max hold of dBA “fast”
 - 1/3 octave analysis for diagnostics information
 - Also test under very cold conditions
- Check of background noise levels
- Material testing (sound Absorption)
 - Interrupted noise method
 - Impulse method
- General product noise testing
 - Noise testing of components
 - Sound power measurements in reverb rooms
 - Transmission loss testing



Coming
in 2007
FFT



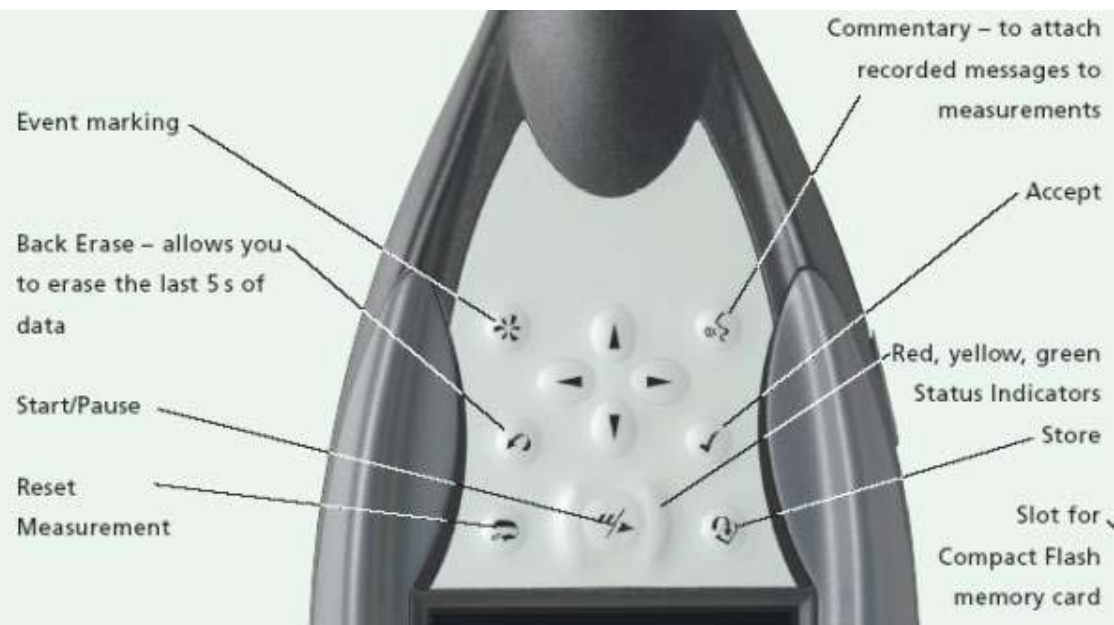
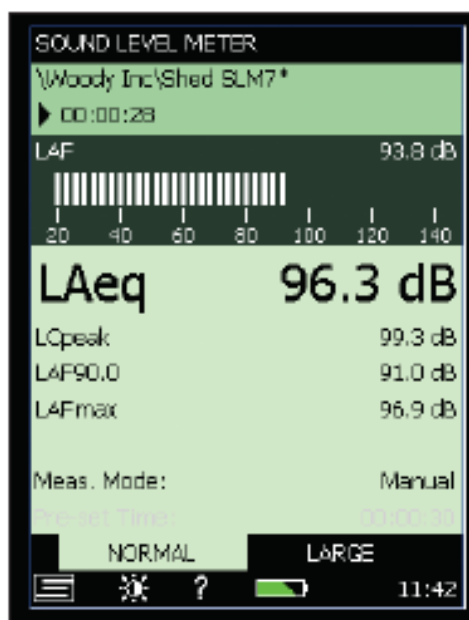
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Operation

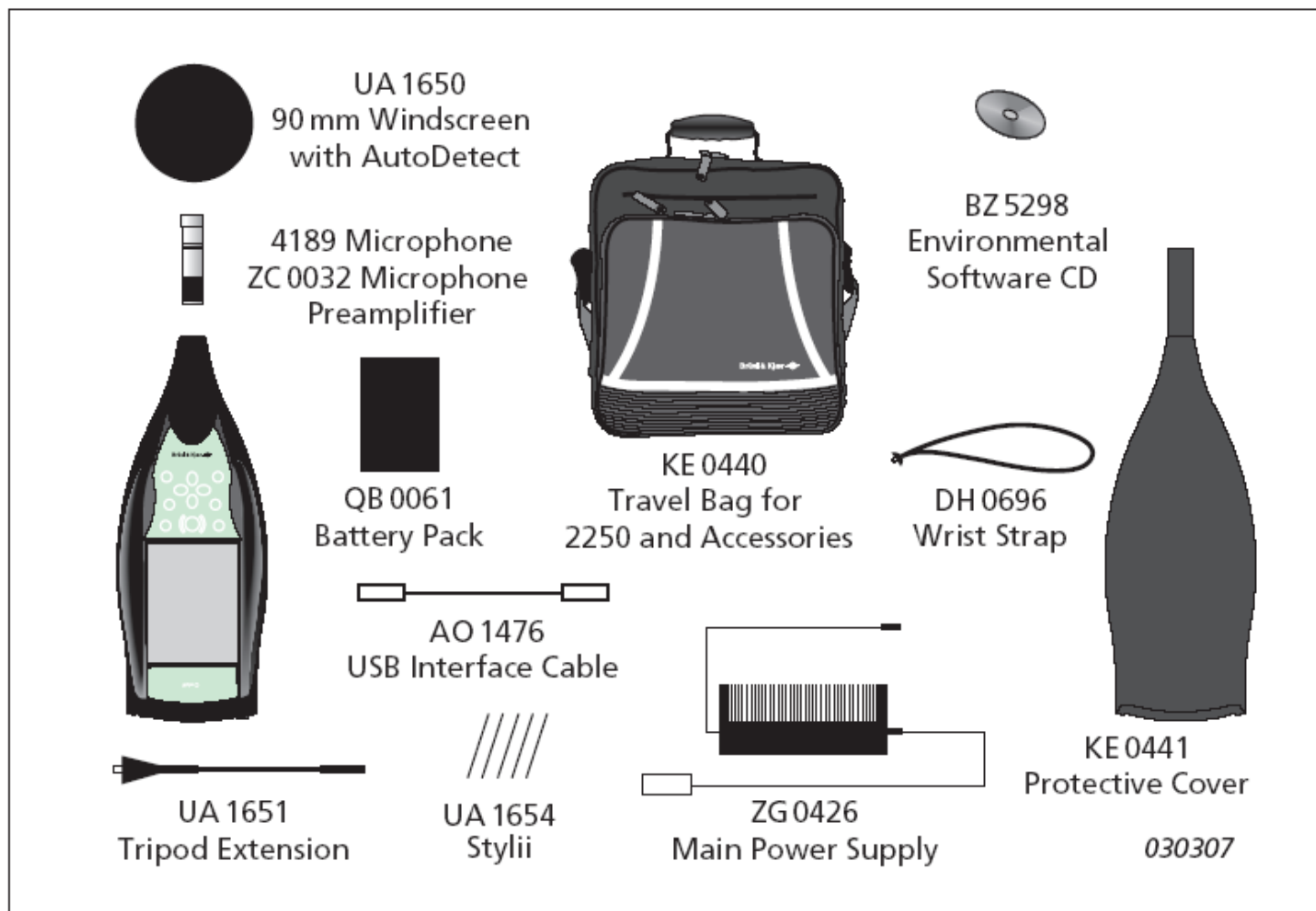


Technology

- **Compact Flash Slot for memory and accessories!**
- **SD – Secure Device Memory Slot ***
*memory chip is included on some models
- **USB Computer Interface – Easy Connectivity**
- **Voice Annotation of measurements**
- **Automatic Windscreen Detection**
- **Multi-User / Multi-Task Log-in and Templates**
- **High Contrast Screen, Large Mode Display**
- **Night Mode and Traffic Light Status Indicators**
- **Very low inherent noise with Microphone Type 4955; well suited for luxury sedans**



Accessories



Summary

Checking NVH Quality Has Never been Easier

- The Type 2250 Analyzer offers
 - Real-time frequency analysis in 1/1- and 1/3-octave bands and total dB A level in large display. No post-processing necessary
 - Easy of use with customized templates - so you don't have to get up to speed each time you use the instrument
 - 120 dB dynamic range eliminates the need for setting attenuators
 - Backlit screen makes viewing easy under all conditions
 - Bright visual "traffic light" status indicators - just a glimpse and you know your measurement is running or finished
 - User interface available in local languages



Want to know more?

- **Contact your local Brüel & Kjær representative:**
 - Go to <http://www.bksv.com/2271.asp> for a list of all global offices
 - Alternatively send an e-mail to info@bksv.com

Copy of the slides **will be available after a few days**

