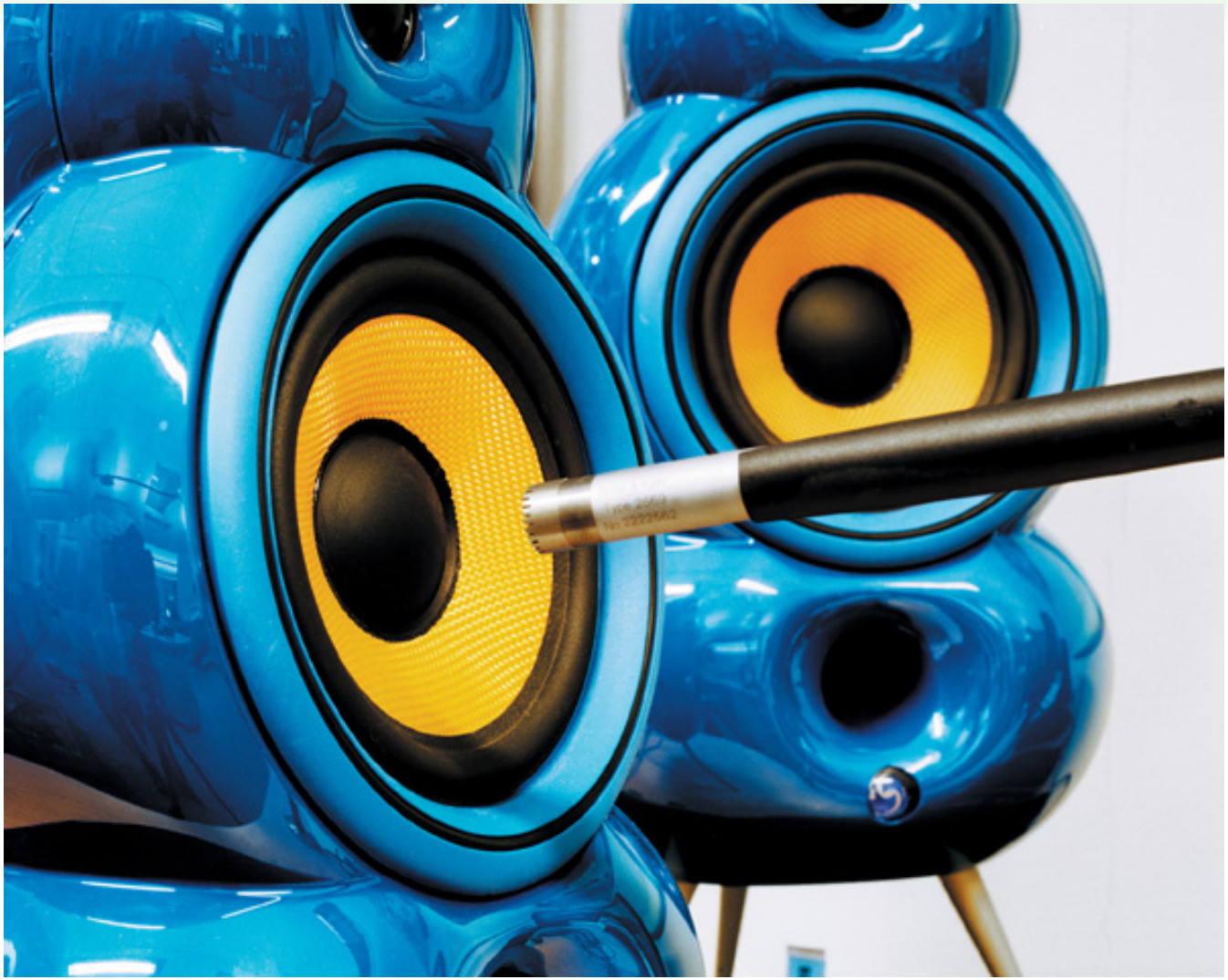
PULSE Electroacoustic - NEWS

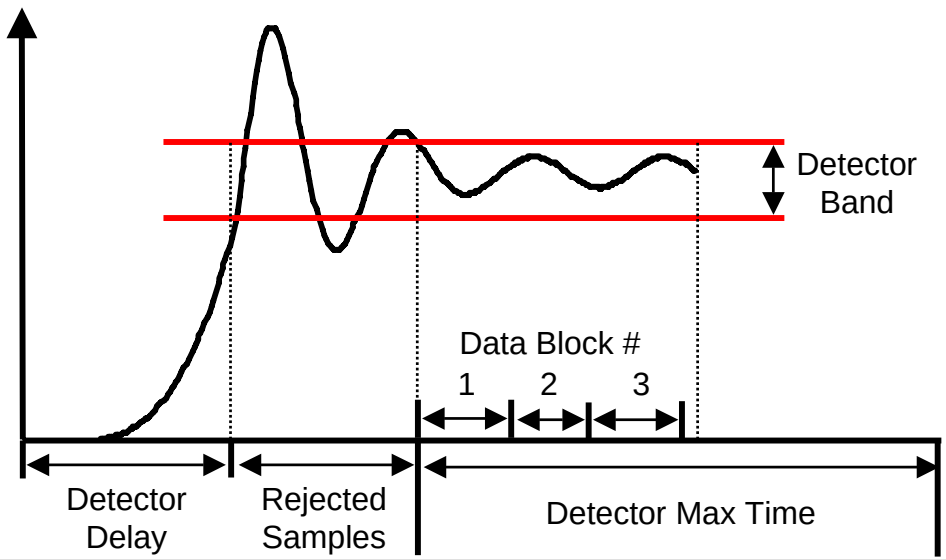


PULSE Basic Electroacoustic

- PULSE Basic Electroacoustic
  - The speed of the SSR Analyzer have been improved.
  - Compared to earlier PULSE version the speed has been increased by a factor of three
  - For power measurements the speed of the SSR Analyzer are now the same as or faster than that of Type 2012

SSR Analyser unique features

- Produce measurements with a known accuracy defined by the user
- Minimises the measuring time without compromising the requested accuracy of the measurement
- Ensure accurate measurements even in the presence of noise



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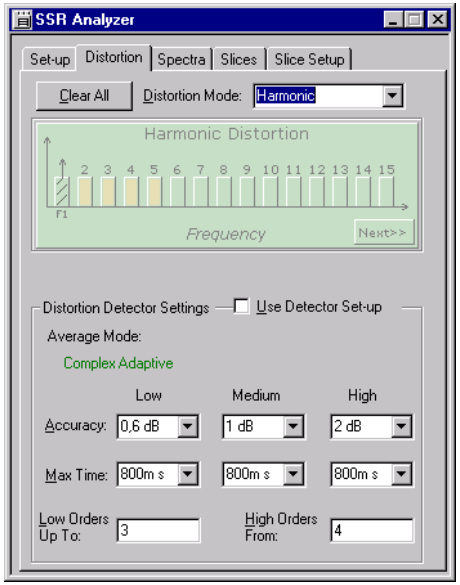
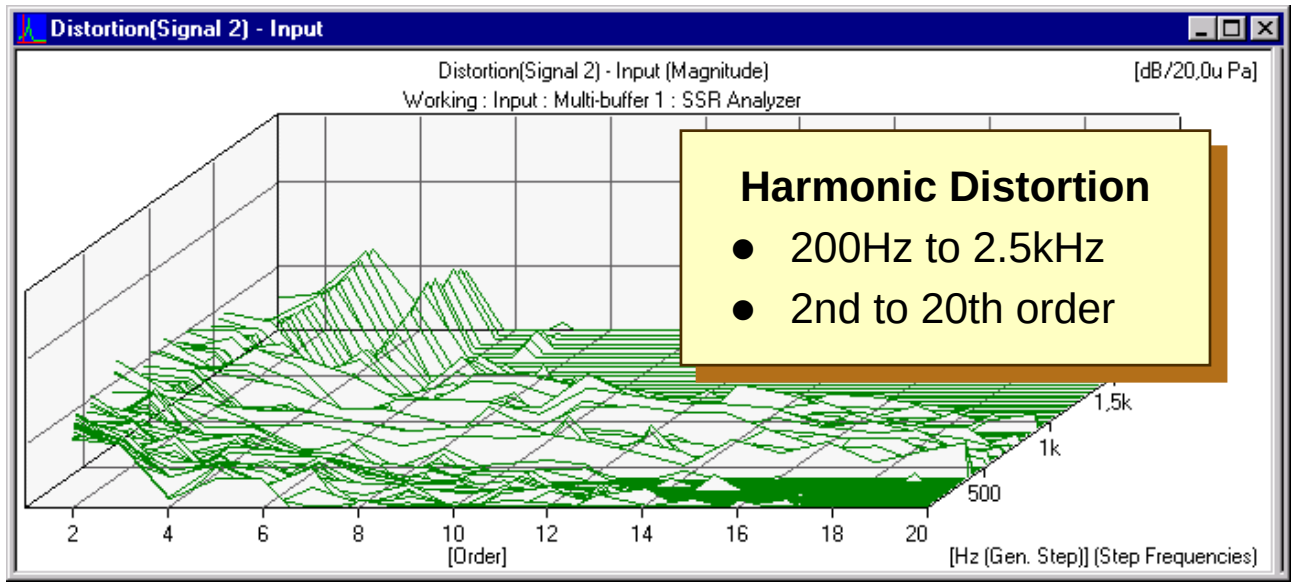
Distortion Analysis

- Distortion Analysis with PULSE SSR enables measurements of
  - Harmonics Distortion components from 2,3,4,5 through 60
  - Intermodulation Distortion components from –9 through +9
  - Difference Frequency Distortion components form –9 through +9 order





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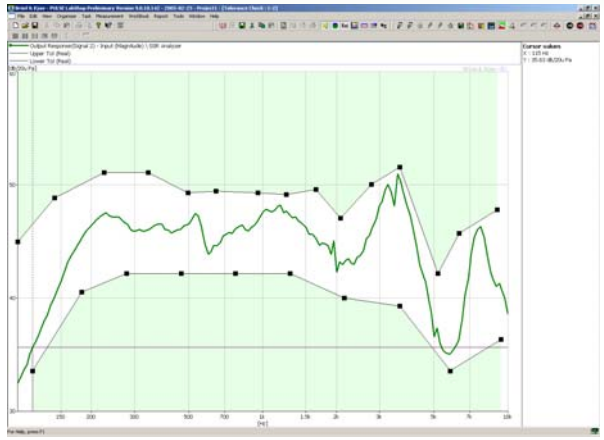
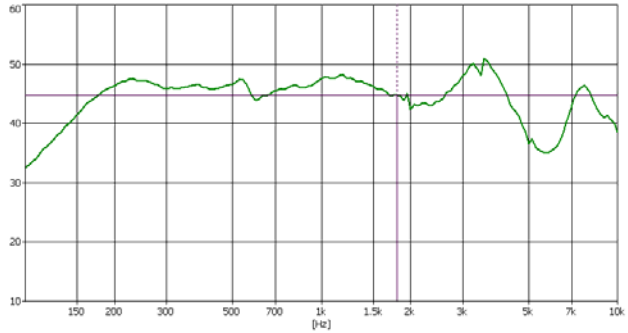
Tolerance Check and IEC-263 reporting

- Tolerance Check
  - Absolute, Floating and Aligned Tolerance
  - Live tolerance check and verdict indication
  - Tolerance masks can be defined as
    - » User defined in tabular form or graphics
    - » Stored measurements (golden device)



- Reporting according to IEC-263
  - Ensure compatible graphical formats
  - Range can be defined by the user
    - » 5dB, 10dB, 25dB or 50dB equal 100mm
    - » 1, 2, 3 or 4 decades equal 100mm or 200mm



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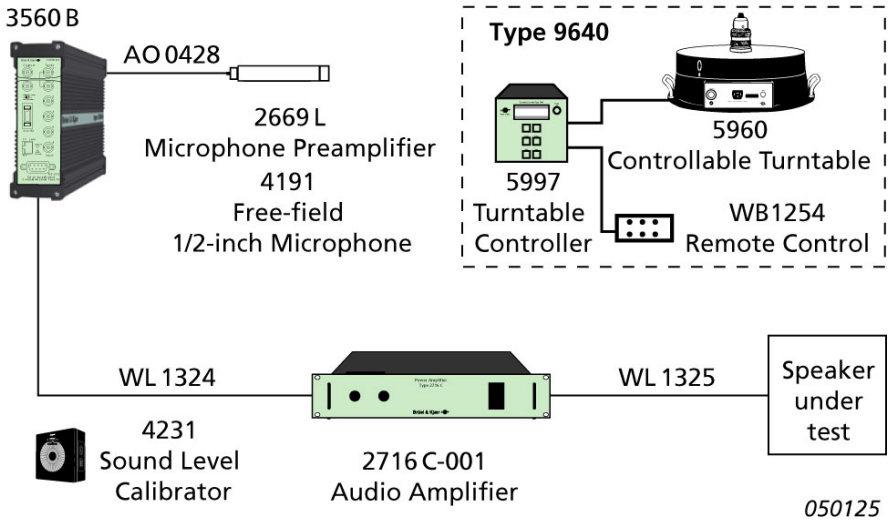
Loudness Rating

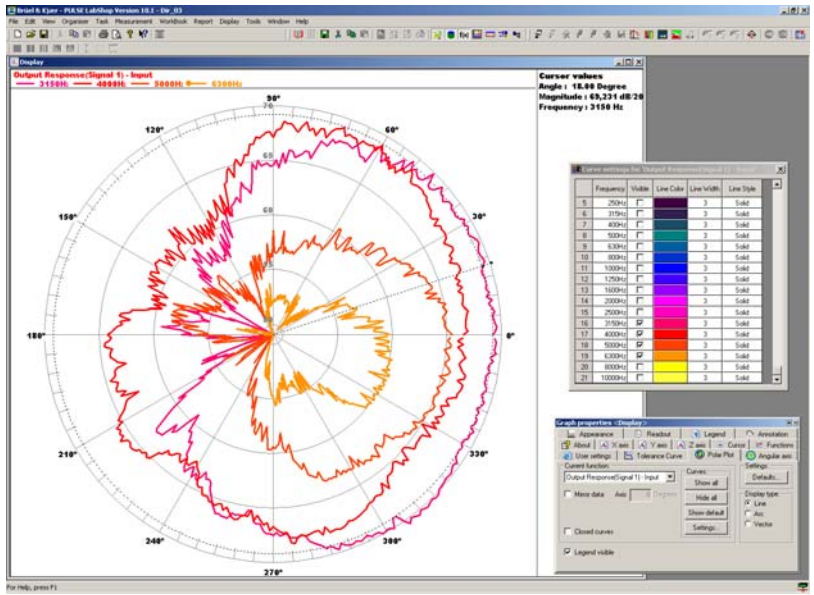
- Loudness Rating Calculations for measurements on Telephones
  - SLR, RLR, STMR, LSTR according to ITU-T Rec. P.79.
  - TOLR, ROLR and SOLR according to IEEE 661
  - Type 4185, Type 4195 and Type 4128 are supported

- Live readout of current Loudness Rating

Directivity measurement and Polar Plot

- Directivity Measurements with PULSE
  - Allows loudspeakers, microphones, etc. to be measured
  - Allow measurements at user defined angles and takes care of controlling the turntable, data management and presentation of data





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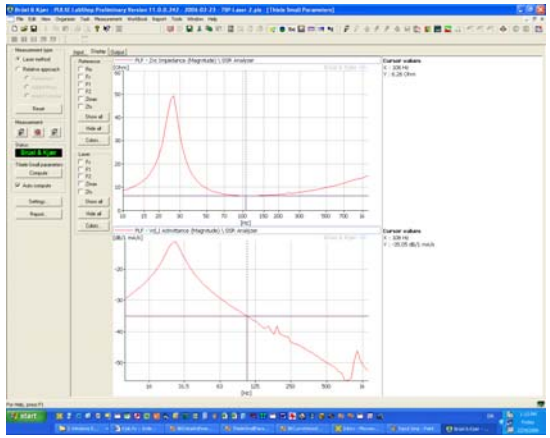
Thiele Small parameters

- Thiele Small parameters
  - Basically the TS parameters are derived from measurement of the loudspeaker impedance
  - Different methods are supported for determining the TS parameters. These are impedance method, added mass method*, added volume method* and laser method
  - TS parameters of interest are selected, calculated and displayed together with the impedance curve
  - Depending on the method used the TS parameters shown on the right are calculated



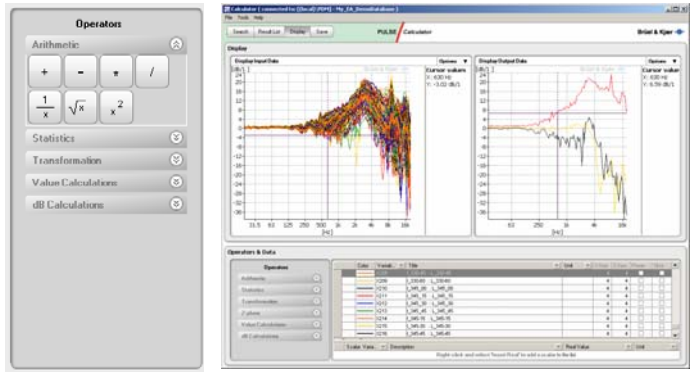
Thiele Small Parameters

- F_s – resonance frequency
- Q_{ms} – mechanical Q
- Q_{es} – electrical Q
- L_{vc} – voice coil inductance
- M_{ms} – mechanical mass diaphragm
- C_{ms} – mechanical compliance
- R_{ms} – mechanical resistance
- V_{as} – equivalent air volume
- BL – force factor
- N_0 – acoustical reference efficiency
- …

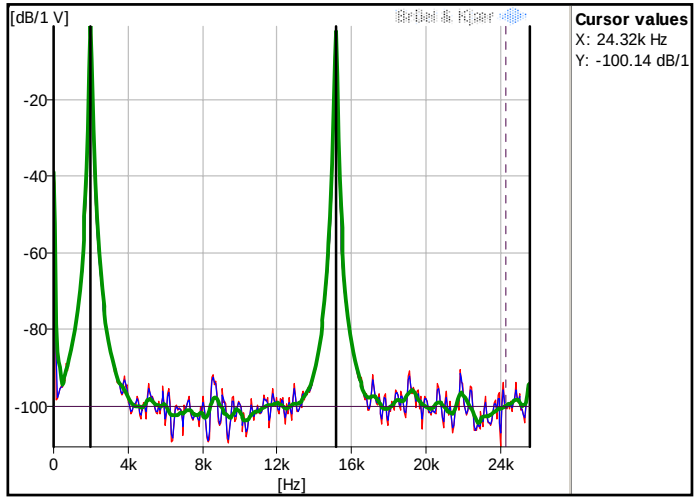
*Note. A free air measurement and a loaded (mass or volume is added) measurement are performed

Calculator operations & Curve Smoothing

- Calculator operations
  - Application of pole & zero
  - Import of Type 2012 data (ada & bin)
  - Import of SoundCheck data



- Smoothing of curves
  - Relative using constant percentage bandwidth (3/6/12/24 octave)
  - Absolute using uniform, binominal or Gaussian
  - When applying absolute smoothing specific points can be excluded from the smoothing process by marking these points.



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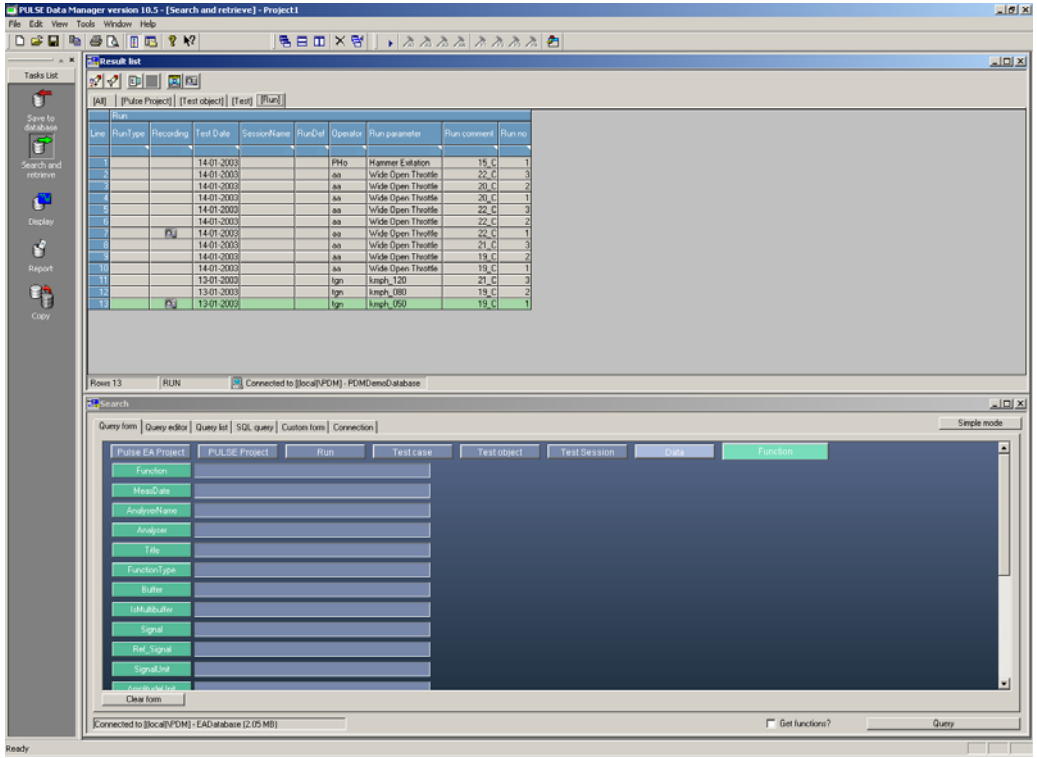
PDM for Electroacoustic

- PDM for Electroacoustics
  - The database is the placeholder for new as well as historic data
  - The calculator are the platform for making calculations on data
  - making reports



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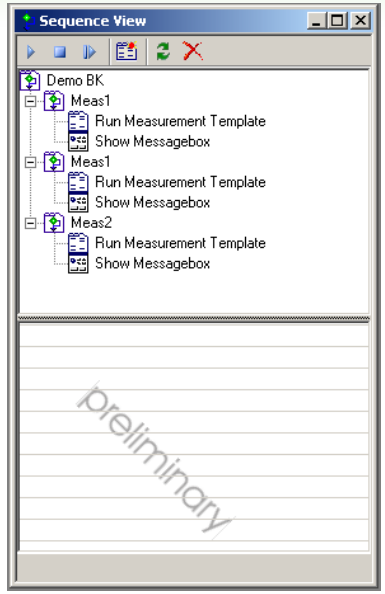
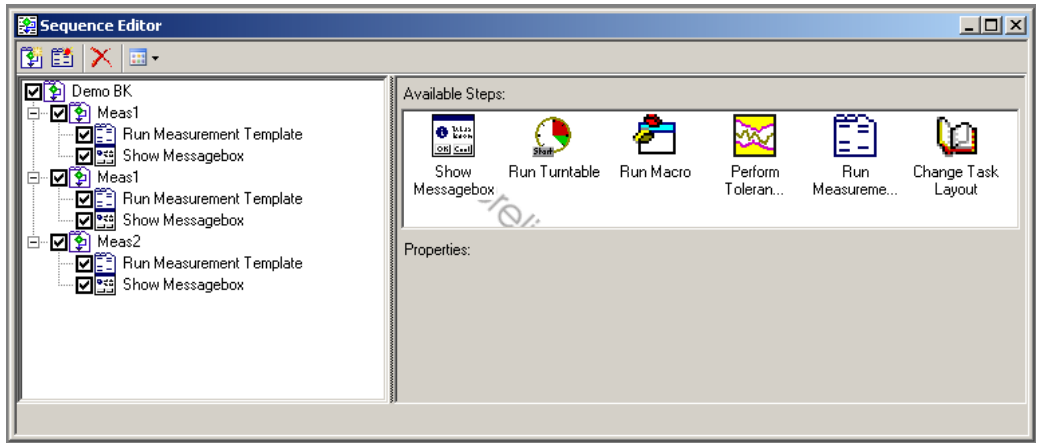
PULSE Sequencer

- PULSE Sequencer
  - Execute pre-defined sequences
  - Creating sequences for specific tasks or complete applications
  - Step types supported - Activate and run PULSE measurement template - Change Task layout - Display Message - Tolerance Check - Turntable control - Execute VBA macro





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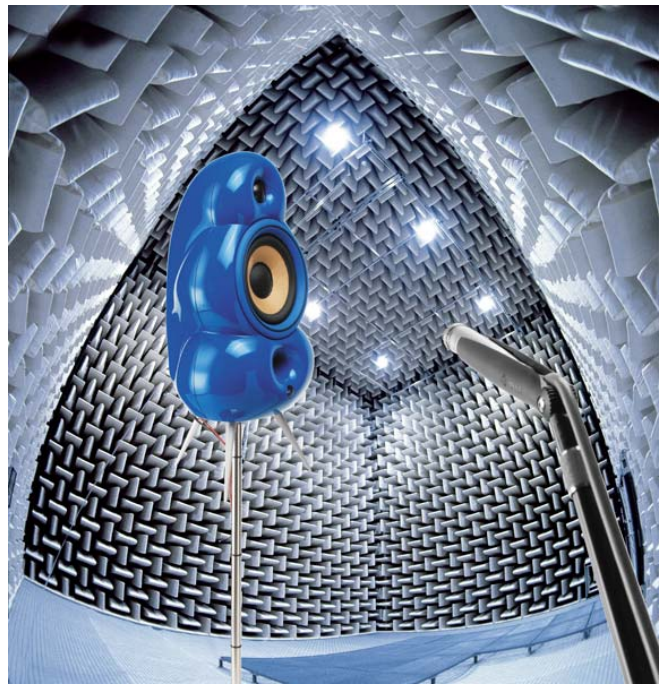
PULSE Electroacoustic

- PULSE Electroacoustics now includes
  - Frequency Response measurement
  - Harmonic Distortion, IM Distortion and DIF Distortion
  - Directional Response measurement & Polar Plot
  - PULSE Data Manager for Electroacoustic
  - Thiele Small Parameter calculations
- New Electroacoustic options
  - PULSE Sequencer – Edit & Play
  - Loudspeaker Test application
  - Receiver Test application



PULSE Telephone Test - News

PULSE Telephone Testing Type 6712 – Overview

- New standards
  - Testing of mobile phones with Hands-free function according to ITU-T Rec. P.342 using free field microphone and mouth simulator
  - Testing of handset GSM/UMTS wideband mobile phones according to version 6 of 3GPP TS 26.132.
  - Testing of handset AMPS/CDMA mobile phones according to 3GPP2 C.S0056-0 specifications
  - Testing of hands-free equipment or microphone systems for in car applications according to VDA

New in P11

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PULSE Telephone Testing Type 6712 – Wideband Audio

NEW in P11

- 3GPP TS.26.132 Wideband
  - New standard for testing of wideband audio mobile phones according to specifications outlined in version 6.0 of the standard.
  - Test Cases very similar to that of Narrow Band specification
  - B&K type number is BZ-5137-039.
  - Wideband audio implies that the frequency range for calibration of mouth simulators has extended to 8kHz
  - Relevant for customers that develop WCDMA mobile phones
  - Remote control of CMU-200 for WCDMA to be available for next version of PULSE Telephone Test software.

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PULSE Telephone Testing Type 6712 – AMPS/CDMA

NEW in P11

- 3GPP2 C.S0056-0
  - New standard testing of AMPS & CDMA mobile phones according to specifications from 3GPP2 organisation approved in 2005.
  - B&K type number is BZ-5137-037.
  - Relevant for customers that use CTIA Test Plan for testing AMPS and CDMA mobile phones.
  - Real speech is used as test signals.

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PULSE Telephone Testing Type 6712 – Hands-free

- VDA Test Specifications
  - The VDA specifies how test of Hands-free devices used in cars has to be performed.
  - The microphone system, mobile phone as well as the complete Hands-free system can be tested.

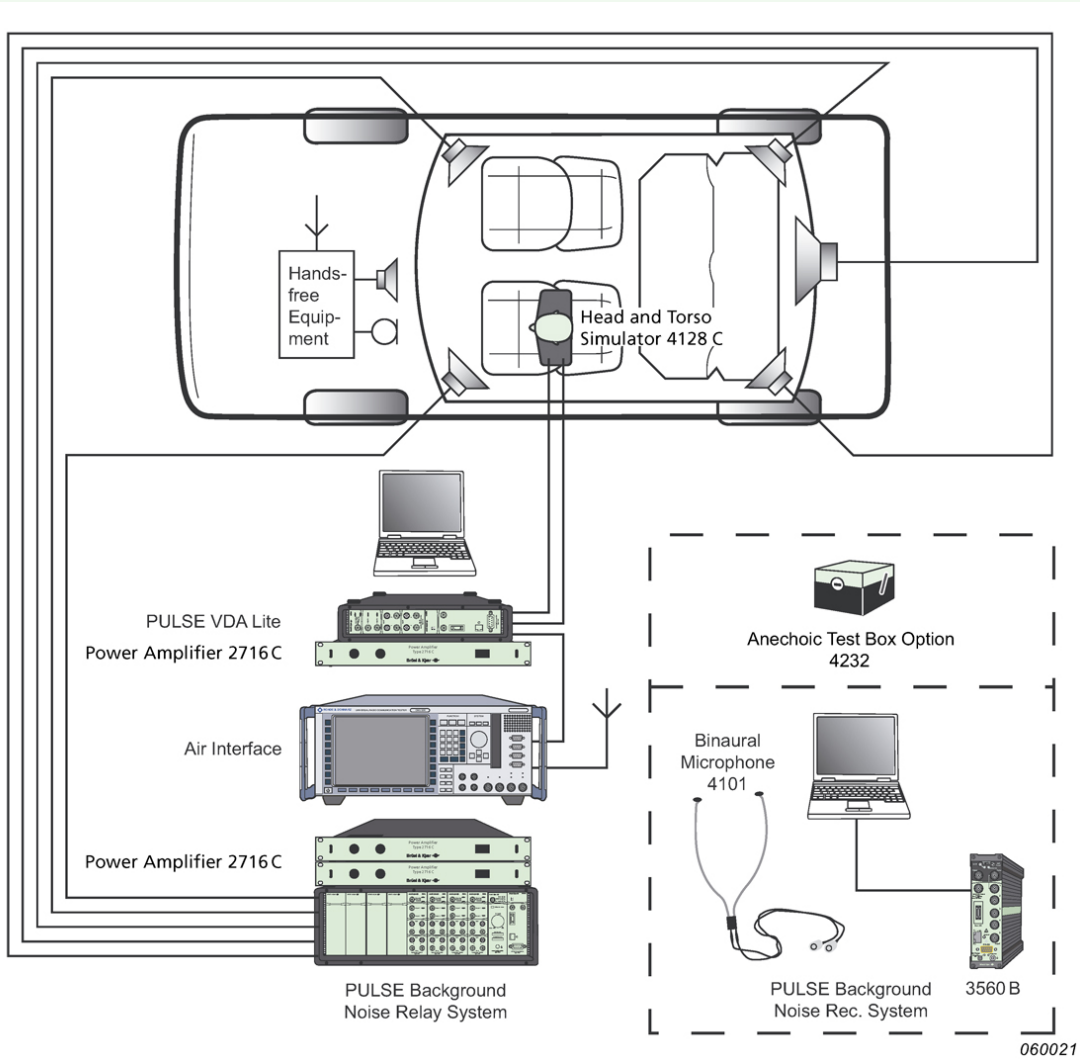
- VDA Solution
  - The solution is based on the PULSE Telephone Test platform – Type 6712
  - Three software packages are available:
    - » BZ-5137-033 for testing of Microphone system
    - » BZ-5137-034 for testing of Hands-free system
    - » BZ-5137-035 for testing of Microphone systems as well as Hands-system in Simulated Noisy Environment
  - One software bundle Type 7909-S1 that include the three software packages are available too.

NEW in P11

PULSE Telephone Testing Type 6712 – Hands-free

- Complete setup for measurements of in car hands-free system.
- Traditional telephone tests for evaluation of the hands-free system
- Recording of noise in the car during driving. To be used when testing performance in noisy environment
- System for replay of car noise

NEW in P11



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PULSE Telephone Testing Type 6712 – M1/M2

- Software Maintenance and Support Agreement (M1/M2)
  - Now available for BZ-5137-017 … BZ-5137-035

- M1 for PULSE Telephone Test includes
  - Automatic receipt of software upgrades and updates
  - Access to technical support via telephone, e-mail etc.
  - Compliance with latest version of Windows
  - Tests that complies with latest version of standards
  - Attractive offering for new standards

- M2 introduction offer to existing customers
  - More information will be available at release

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Upcoming B&K university course

- Electroacoustic measurements on Telephones
  - It is a 3 days course starting on September 20th
  - Topics relating to measurements on Telephones are explained and demonstrated
  - More information and registration check on www.bksv.com under events, courses & training, headquarter courses

Headquarter Courses

Brüel & Kjær University is the global competence centre for sound and vibration. As part of our mission we develop, collect and share knowledge related to sound and vibration - for the benefit of our customers, end-users and society as a whole.

Brüel & Kjær University, Denmark, offers courses within a broad variety of applications, theories and products.

Start date	Duration	Course name
~~21 Mar 2006~~	3 days	Electroacoustic Measurements on Telephones - March 2006
~~3 Apr 2006~~	2 days	PULSE™ with FFT & CPB software - April 2006
~~5 Apr 2006~~	3 days	Modal Analysis - April 2006
~~24 Apr 2006~~	3 days	PULSE™ Visual Basic - April 2006
~~27 Apr 2006~~	2 days	PULSE™ Data Management Workshop - April 2006
~~4 May 2006~~	2 days	Operational Modal Analysis - IOMAC Workshop
~~9 May 2006~~	2 days	Sound Quality - May 2006
~~8 Jun 2006~~	2 days	Advanced ODEON (Type 7835/6/7) - June 2006
~~12 Jun 2006~~	1 day	Predictor™ (Type 7810) - June 2006
~~13 Jun 2006~~	1 day	Noise Monitoring Solutions - June 2006
~~14 Jun 2006~~	2 days	Environmental Noise Management - June 2006
~~16 Jun 2006~~	1 days	Lima (Type7812) - June 2006
20 Sep 2006	3 days	Electroacoustic Measurements on Telephones - September 2006
26 Sep 2006	2 days	PULSE™ Electroacoustic Measurements - September 2006
2 Oct 2006	2 days	PULSE™ with FFT & CPB software - October 2006
4 Oct 2006	3 days	Modal Analysis - October 2006
11 Oct 2006	3 days	Automotive NVH Course - October 2006
17 Oct 2006	3-days	Integrated Noise Model By FAA (INM)
25 Oct 2006	2 days	Sound Power Determination - October 2006
30 Oct 2006	2 days	Advanced Acoustics - October 2006
1 Nov 2006	3 days	Noise Source Identification - November 2006
14 Nov 2006	3 days	PULSE™ Visual Basic - November 2006
27 Nov 2006	2 days	PULSE™ with FFT & CPB software - November 2006
29 Nov 2006	3 days	Rotating Machinery Diagnostics - November 2006