New Pathways to Sound Quality Evaluation

The Sound Quality Representative and Evaluation Studio SQuare from HEAD acoustics is the new, aurally-accurate and easy-to-operate system solution for subjective sound evaluations. Flexible hardware and software options provide jury testing professionals with the flexibility to configure the optimum listening test to meet any objective.

The speed at which test preparations can be completed is testimony to the efficiency of the system. Generation of all test conditions to your specifications is fully automatic. You retain full flexibility in selecting your evaluation criteria. For example, a presentation of the test conditions, to acquaint jurors with the dynamic range of the sounds to be rated, can be completed with just a few settings.

Individual tests, Group tests and Interactive mode are among the options available. Individual tests involve the networking of a number of PCs and aurally-accurate playback devices with a Master PC. The evaluators (the system allows any number) are able to decide the listening sequence of the individual sounds and can listen to the sequences consecutively any number of times. These are just a few examples of the many useful features the system provides. Ratings are given either via touchscreens, or handheld devices that include a keyboard and display. Ratings are automatically relayed back to the Master.

Equalization and SPL (Sound Pressure Level) in all test options are automatically set by the sound quality evaluation system.

Loudspeaker playback is a further option. Extended functionality is provided in “Interactive Mode”. The Master provides individual control of the session, which is especially recommended for the presentation of sounds.

The high-performance SQL database is available for storing all test outcomes, settings, play-lists, sounds, and other related data. Statistical analysis of tests are available immediately and can be expanded according to individual requirements. The software runs under Windows® 2000 and XP. Export of data to alternative formats, e.g. Microsoft® Excel is easily accomplished.

The all-round compatibility (hardware and software) of all HEAD acoustics products allows for seamless system expansion. In particular, combining SQuare with the popular ArtemiS measurement and analysis software, allows you to achieve sound recording, filtering, analysis and psychoacoustic processing, and instant insertion of sounds to the play-list.

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Tomorrow's passby measurement system from HEAD acoustics: virtual and aurally-accurate

**Future-facing Sound Design in the automobile industry** is increasingly founded on acoustic simulation. Passby measurements also enable time-consuming and expensive tests involving real vehicles to be reduced to a minimum. Key to the reliability of acoustic simulation results is the quality of recording and playback.

**HEAD acoustics is currently developing** a versatile and user-friendly solution in terms of both hardware and software geared to meeting the challenge of tomorrow's needs: acoustic measurement via aurally-accurate recording and playback with authentic, true-to-original simulation of passby. Extending beyond the standard procedure to ISO 362, the new system will enable measurements made using standard monaural microphone arrays in test stand simulations (dynamometer) to be transformed into aurally-accurate measurements.

**Your benefits** are significant: the new HEAD acoustics system achieves results in the test cell, regardless of weather conditions and other factors, and enables users to hear the actual sounds made by a virtual vehicle and allows them to make the correct psychoacoustic analysis. The new technique also permits transformation of the passby sounds of vehicle components into binaural recordings, thus allowing better and faster identification of prominent sound components.

**Binaural recordings** of the sound of the individual sources can even be combined to achieve the virtual passby of a virtual vehicle. HEAD acoustics also provides an all-round and compatible solution enabling users to achieve targeted virtual modification of individual sound components (engine, tires, exhaust silencer and air induction inlet of the engine) with subsequent reintegration of these components into the total acoustic scene.

This virtually eliminates the necessity of expensive prototypes of actual vehicle components by placing the major part of sound design in the virtual realm. The program takes into account the transfer functions of the individual elements and calculates how the sound they produce is modified via the Doppler effect. From this data, it is possible to synthesize a total virtual passby sound. Modifications can be heard by users immediately and exactly as they would sound in reality.

**Development times** in the automobile industry will shorten considerably thanks to the application of binaural, virtual simulation. Cost- and time-intensive tests on test stands can be reduced to a minimum and resources devoted to other tasks. We look forward to unveiling our new product to the public very soon!
How to raise a test protocol in 28 minutes using ArtemiS 4.0

Friday, 12.09 p.m.
My team leader calls: he must have the project results on his desk no later than 1.00 p.m. All 43 measurement and analysis results in representative form! How will I ever get it done in time?

12.11 p.m.
I seem to remember something about automated data reports in the HEAD acoustics documentation.

12.11 p.m.
I open the Quick Guide and begin to read. I start ArtemiS and select one of my files as a sample from the ArtemiS Source Pool. Select filters and analyses and then activate "Report Generator" in the Destination Pool by clicking on "Insert" using the right mouse button. Then, I press "Calculate".

12.15 p.m.
Nothing much seems to be happening, except that I notice some new icons displayed in the Destination Pool. The Quick Guide tells me to click "Report Generator" using the right mouse button and then select "Word Wizard" (sounds promising).

12.18 p.m.
A new window opens. A layout is graphically displayed on the left, with further options on the right. I try them all and select the layout called "Header" (seems to be what I was looking for). I click the "Next" button and see my "Header" displayed in a new window.

12.21 p.m.
Now I need to adapt the layout to my requirements, just like with a standard Word table. I need a new field at the top. I subdivide the large field into four sections, enter style and size for fonts. OK.
Now I fill out the various sections of the window with content via a mouse click: Our company logo with "Insert Bitmap" top left, name of the department, date, file, measurement, measurement description, and so on.

12.27 p.m.
Time's getting short. Now insert the diagrams into the large fields.

First click in the window, then click "Insert Diagram" (an empty diagram is displayed). On the right in the wizard, I see the individual diagram names and click on them.

12.30 p.m.
Finished! The wizard enters all diagrams immediately, all correctly scaled. They fit perfectly.

12.31 p.m.
Now just click the "Finish" button and enter a name for the template.

12.33 p.m.
Just a half-hour left. The Quick Guide says that I can now drag and drop my 43 files onto the template. From the options "nothing", "print" or "save doc's", I select "print". Maybe this will save time. I drag the whole folder out of the Source Pool and onto the template.

12.36 p.m.
ArtemiS works to process the data.

12.37 p.m.
All project reports are ready as Word documents, including all data and diagrams.

12.37 p.m.
ArtemiS prints all 43 protocols. While my printer is busy (I become aware how slow it is), I have time to prepare a folder for them.

12.37 p.m.
Done, with 20 minutes to spare! Time to grab a coffee before the meeting.

12.37 p.m.
Fall 2002
HEAD acoustics Training Center

New: ArtemiS Workshop!
Are you interested in having your own, individual and specific questions dealt with in a training? HEAD acoustics has been offering this kind of training for the past year!

All interested participants can pose their own questions prior to the training and have them included on the training agenda.

The competence of our development department and of our trainers is at your disposal, our team offers ways of solutions for the topics that you have previously insinuated.

Key terms, for example, could be:
- Filtration of one order
- Automatic cutting of raw data sets
- Analyses of rotational vibration

You would like to have our current brochures concerning trainings or you require further information about the training contents? Do not hesitate to call us: +49-2407-577-35 (Ms. Beate Wassenberg)

Courses & Dates in 2002
ArtemiS (in English) 22-23/10/2002
ArtemiS Advanced (in English) 24-25/10/2002

Exhibitions & Seminars

September 16 - 20  Forum Acústicum (EAA) 2002, Sevilla (Spain)
Research contributions by HEAD acoustics:
1. “Soundscape Design – Acoustical Challenge”
2. “Psychoacoustics – Importance and Application in Practice”
3. “Sound Quality of Vehicle Exterior Noise”

October 7-9  11th Aachener Kolloquium “Vehicle- and Motortechnique”, Aachen (Germany)

October 22-24  Forum Mesure, Paris (France)

November 7  Achievements in Noise and Vibration, Coventry (Great Britain), Contribution by HEAD Consult “Vehicle Interior Noise Simulation – Importance and Application in Practice”

November 28-29  European LMS Conference for Physical and Virtual Prototyping, Stuttgart (Germany)

December 2-6  ASA ’02, Cancun (Mexico)

We are looking forward to your visit!