

Example of TUNE result window. Top left: overall result values. Top right: Quality Pie for overall results. Down left: Extended result values by segment. Down right: segment result diagram.

Overview

The reception of radio broadcast signals under dynamic conditions may be disturbed in various ways as often experienced in driving situations. Audible and disturbing „pops“, additive noise, short term „mutes“, „high cuts“, or noticeable stereo/mono switching occurs. These disturbances are caused either by bad reception conditions (loss of transmission energy, interferences, multiple transmission paths etc.) or by masking techniques applied in order to improve audio quality.

The HEAD acoustics Radio Analyzer Tool TUNE allows a reproducible analytical evaluation of the impact of analog radio broadcast disturbances on perceived audio quality based on auditory test results.

DESCRIPTION

Radio Frequency (RF) recording equipment is used by e.g. the manufacturers of radio broadcast receivers in order to record a given RF signal under dynamic (disturbed signal; test drives on public roads) and under static conditions (undisturbed reference signal). These RF recordings are then applied to different radio broadcast receivers and guarantee absolutely realistic and reproducible test conditions.

Up to now, the audio evaluation usually had to be done manually by expert listeners under laboratory conditions, often even requiring real test drives involving several test persons in a car. With the HEAD acoustics Radio Analyzer Tool TUNE, this evaluation can now be conducted for various sound environment scenarios (e.g. different car cabins) in a fast and easy but yet reliable, reproducible and objective manner.

TUNE is based on extensive auditory tests with far more than 2000 individual quality ratings of license-free speech and music samples in realistic environments (incl. the acoustics of car cabins). TUNE detects typical signal impairments and gives a statistic overview of their occurrence over time, thus allowing an objective comparison of the performance of different receivers.

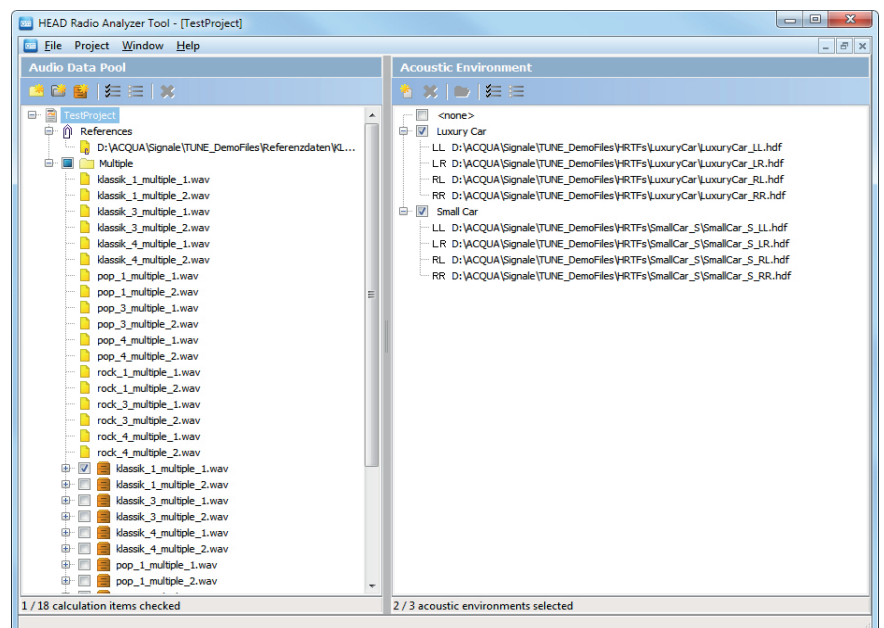
Moreover, TUNE's hearing-adequate analytical model is capable to analyze the processed audio output of receivers while considering human perception of typical disturbances, providing results with high correlation.

The disturbances can be divided into the following parts:

- Typical disturbances for varying HF conditions:
 - „Pops“: short-time noise bursts (RF multipath effects)
 - Noise: constant additive noise (low overall signal level)
 - Switching/transition from stereo to mono (low SNR in stereo carrier)
- Typical artifacts resulting from the receiver's attempt to mask disturbances:

- „High cuts“: Insertion of temporal low pass to avoid or at least lower the disturbances caused by audible pops
- Mute: Signal on both channels is muted to avoid audible noise

Note: TUNE conducts a reference-based analysis, thus the corresponding RF recording hardware as well as audio recordings and audio reference files must be provided by the user.



Example of TUNE project window. Left subwindow: Audio data pool with reference files, sound files and calculations. Right subwindow: Acoustic environments (e.g. small car, luxury car, ...)

APPLICATIONS

- Objective evaluation of the impact of analog radio broadcast disturbances on perceived audio quality based on auditory test results.

FEATURES

- Hearing-adequate analysis of receiver signals
- HRTF filtering to simulate specific car cabin environments
- Validation based on extensive auditory tests (>2000 single judgments)
- Batch calculation possible
- Results presented as MOS values and as easy-to-read "Quality Pie Charts" according to ITU-T P.501
- Speech and music samples are included
- Three music genres (classic, pop, rock)
- English test sentences (simulated news-caster) according to ITU-T P.501
- Supported file formats (time signals for input): .dat, .wav, .hdf
- Report generation (.doc, .pdf, .rtf)

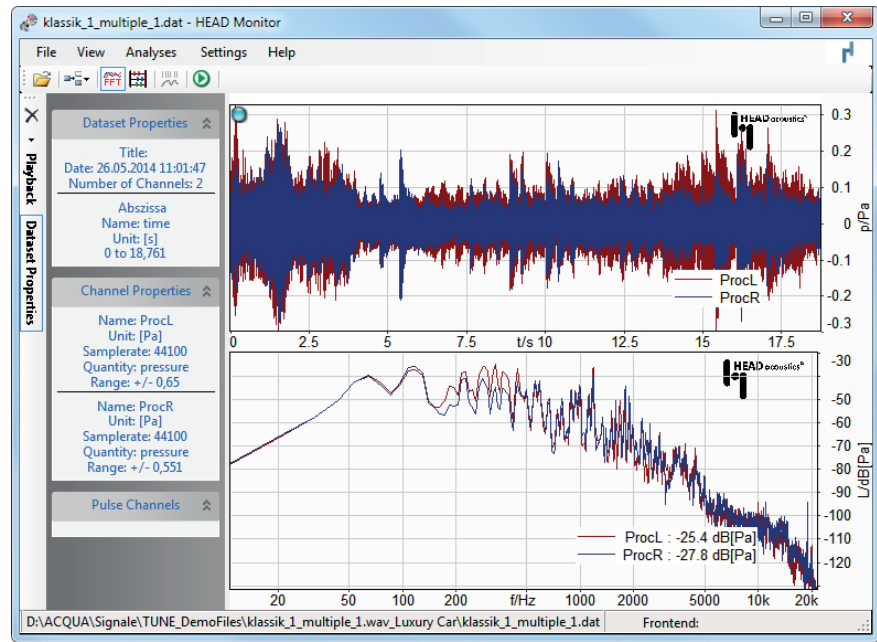
SYSTEM REQUIREMENTS

The PC (not included in the delivery) on which TUNE is installed should meet the specifications required by Microsoft® for the operating systems Windows® 7 Professional or Windows® 8/8.1 Pro (English or German version, including all current service packs).

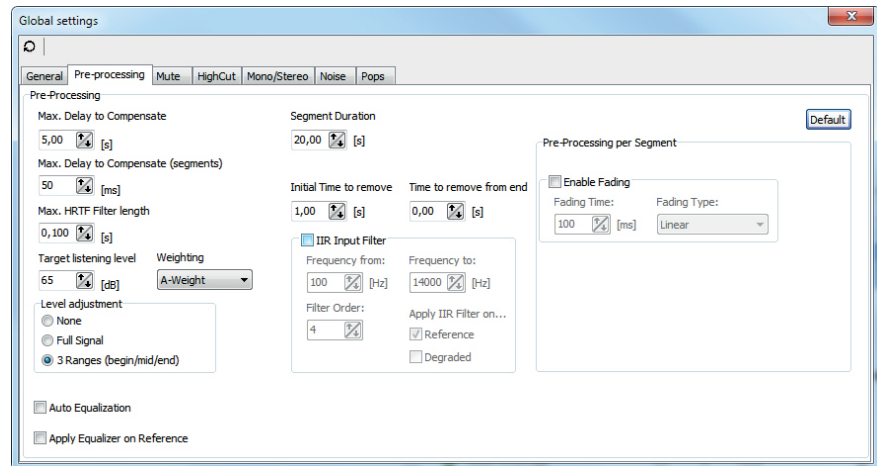
STANDARD DELIVERY ITEMS

TUNE (Code 6978) comprises the following components:

- Setup DVD, including demo project
- Dongle (USB)



HEAD Monitor is included in delivery and can be used for playback and basic analysis of signals



Parameters influencing different types of disturbance can be modified. Parameters can be reset to recommended default values by click of a button.

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