

Nor848A Acoustic camera

Metro station in Taipei, Taiwan



Verification of efficiency of noise reduction measures: Metro station in Taipei, Taiwan, May 2013

After the construction of the elevated sky train, too high noise levels were appearing under the line and local communities were complaining. Therefore acoustic absorbing panels were mounted under the metro line at critical sites in order to reduce noise emission. To document the effect of the absorbers a Norsonic Nor848A 1.0 meter acoustic camera was setup for recording and reporting on the results.

Measurement

The acoustic camera was setup under and next to a position where one could see both the treated and untreated surface. Recordings were done both during train passage on the sky bridge and during bus and motor cycle passages under the bridge. By the use of the virtual microphone one could listen to the contribution from the different elements of the bridge. It proved itself as a very efficient tool to demonstrate the impact of the absorbing panel in real time. With only using your ears for listening the sound field

were too complex with reflections and multiple sources to distinguish the difference of the treated and untreated part. Measurement with intensity probes would be time consuming and also give a very costly measurement setup and could only be done by experts in the field of acoustic measurements.

Result

With the Nor848 acoustic camera the efficiency of a noise reduction project can clearly be shown graphically as sound level colour plot on a picture or video, in graphs with frequency components as octave, third octave or FFT or in tabular format. The function of the virtual microphones gives the operator a powerful tool to identify and evaluate single sources in a complex sound field.

For this particular case the acoustic camera immediately could present the efficiency of the noise reduction measures that had been implemented. The broadband noise transmitted and reflected from the untreated part of the bridge were about 5 dBA above the contribution from the treated area.



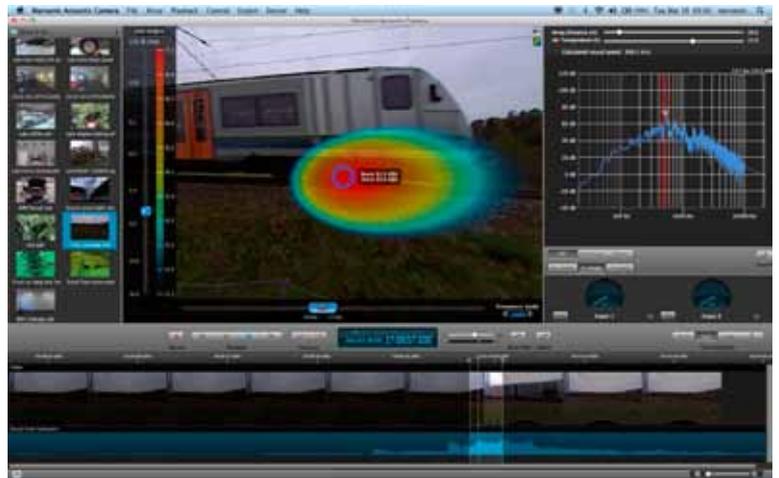
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The Norsonic Nor848A acoustic cameras sets a new standard for acoustical cameras. The large number of microphones eliminates the problems of ghost-spots, compared to traditional acoustical cameras where the relatively low number of microphones increases the side lobe effect, resulting in the so called ghost- spot effect: You “measure” a non-existing source.



The Nor848A software is extremely intuitive and easy to use. Just after a few minutes of training, the user is able to operate the system and do real measurements. Three camera frontends are available: A 0.4 meter array holding 128 microphones, a 1 meter array holding 256 microphones and a 1.6 meter array with 384 microphones. The system enables the user to perform noise analysis with a clear view of where the different noise sources are located in real time.

The system is ready to measure in just a few minutes after entering the site. By moving the cursor in the picture you may analyze and listen to the sound in the selected directions while doing the measurements. This enables the user to identify the problem, whether it is an annoying sound, a leakage or other difficult noise problems in just a fraction of time compared to traditional methods.



The Taipei Metro, more commonly known as the MRT (Mass Rapid Transit or Metro Rail Transit) or formally as the Taipei Rapid Transit System, is a rapid transit system serving metropolitan Taipei in Taiwan. The system is built and operated by the Taipei Rapid Transit Corporation (TRTC) and consists of 97 stations and 112.8 km of revenue track. The system carried an average of over 1.78 million passengers per day in December 2012. (*Wikipedia*)



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