



**35**  
Years

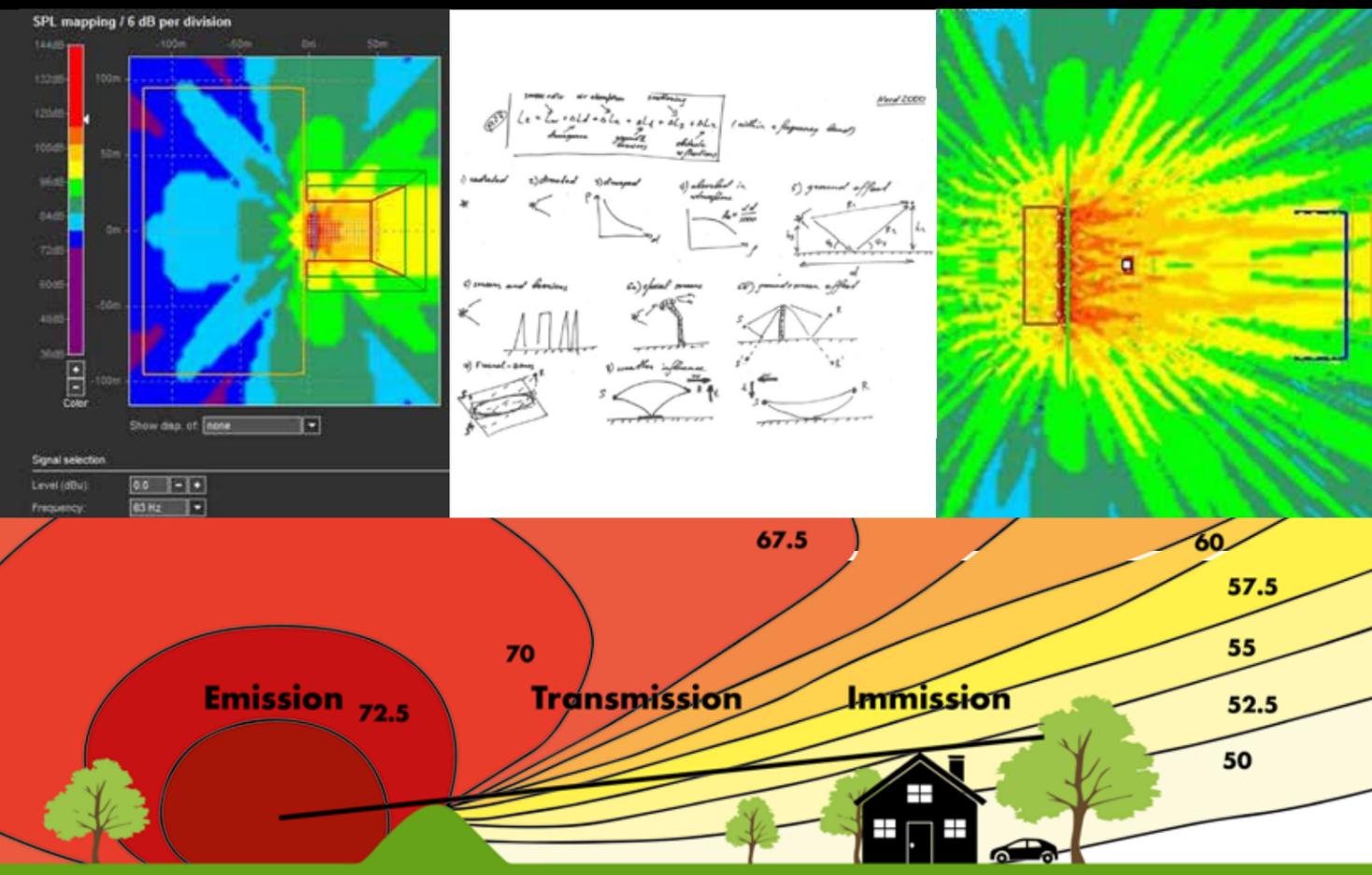
# Emission – Transmission – Immission

The d&b NoizCalc immission modelling software.

Welcome to System reality.

d&b  
audiotechnik 

# The d&b simulation software.



## Delighting the audience, respecting the neighbours.

d&b audiotechnik loudspeaker systems have been performing at live, open air events for over thirty five years. As audio quality expectations have grown, along with the scale and popularity of the events themselves, so too has the realization that not everyone wants to be part of the party. As a result the demand on sound reinforcement systems has never been higher: premium sound for the crowd, peace and quiet for the people at home.

The d&b ArrayCalc simulation software faithfully predicts the exact performance of a d&b loudspeaker system in any application. This tool visualizes a complete electroacoustic design and the tasks associated with system modelling, placement, prediction, alignment, level, safety parameters, rigging plans and parts lists. For over a decade ArrayCalc has been guaranteeing consistent sonic fidelity, improving the listening experience for audiences everywhere. But there has never been a simple way to predict how sound propagates from the audience listening area into the local surroundings, that is, until now.

NoizCalc is the latest addition to the d&b software arsenal. NoizCalc takes the complex loudspeaker data from ArrayCalc and models immissions in the far field using the ISO 9613-2 or Nord2000 calculation standards. Using 3D geographical data, NoizCalc overlays an accurate prediction of the transmission effects across the terrain from the audience listening area into the surrounding region. This enables system designers to evaluate the effects of the sound reinforcement system, and any potential noise disturbance, during the event planning stage.

The d&b simulation software package delivers a twofold promise: a sound reinforcement system which ensures sound is transferred consistently to every member of the audience exactly as intended, while also assessing the audible impact on areas outside the intended listening zones. With these tools, the optimal sonic experience is delivered reliably and faithfully to the right ears.

# Coherent sources.



## Modelling line arrays, subwoofer arrays and delay systems.

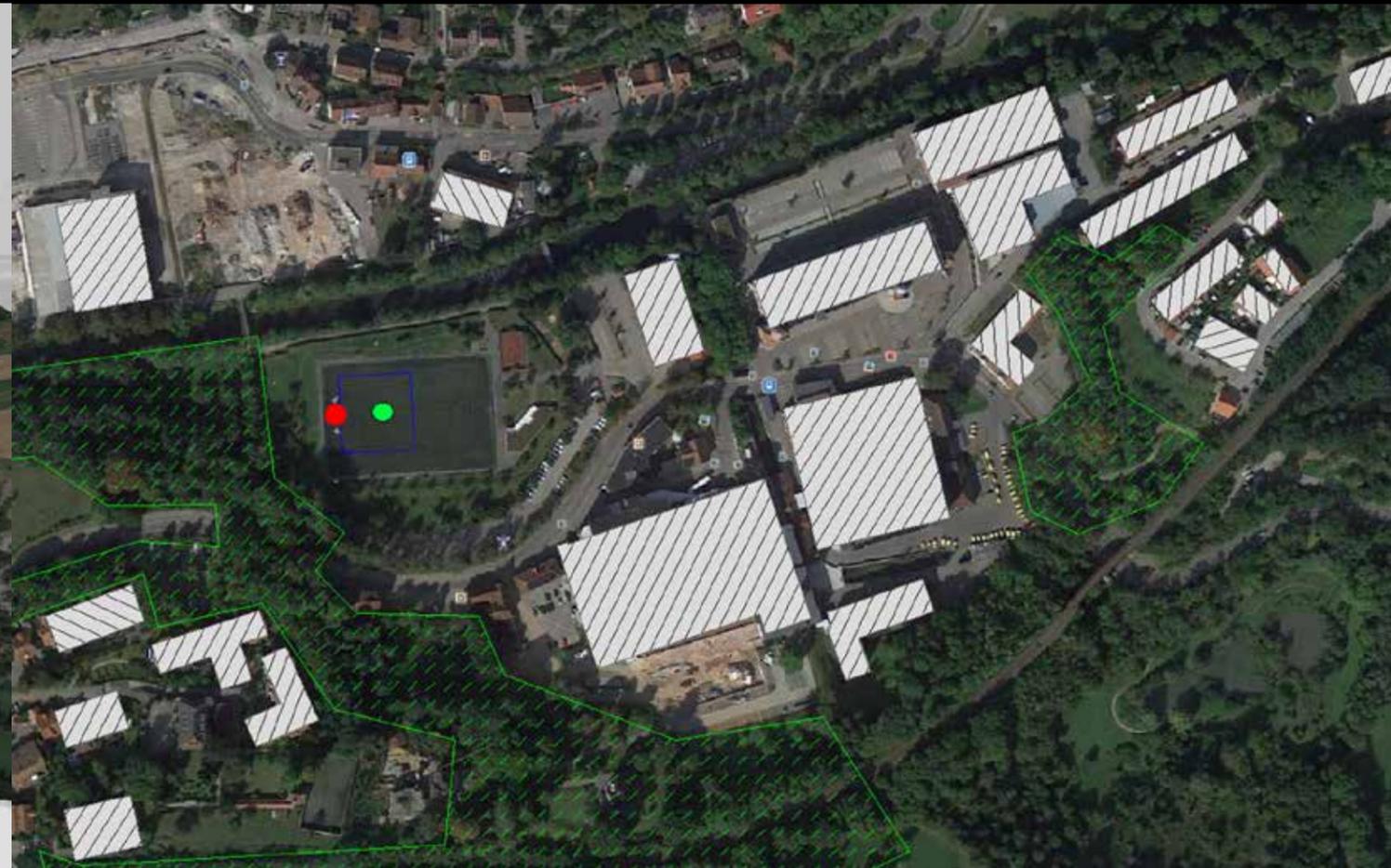
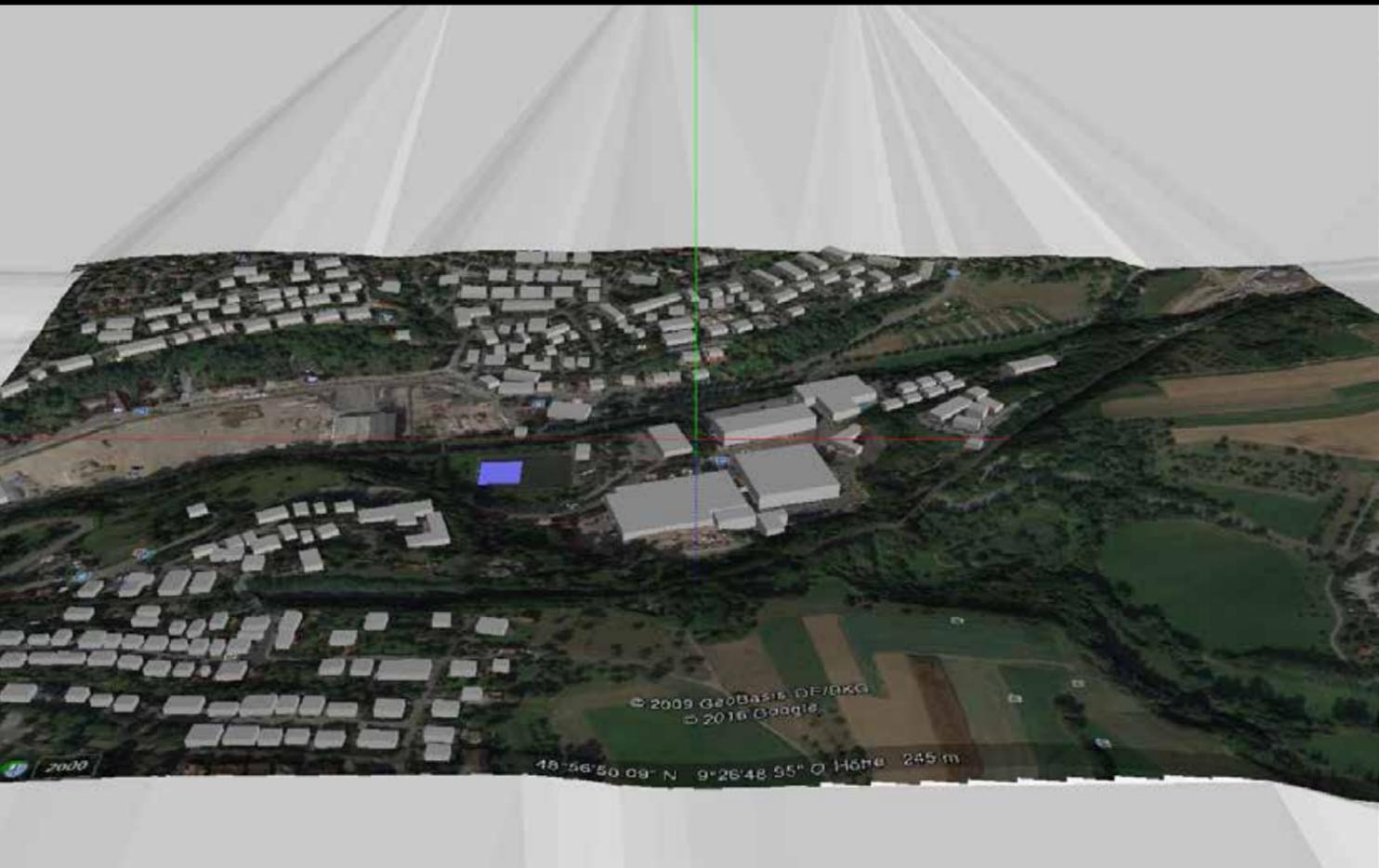
The benefits of modern line source solutions are proven: improved level drop over distance, directivity control and enhanced consistency have elevated the quality of live sound reinforcement dramatically.

The d&b ArrayCalc simulation software specifically targets the audience listening area with the objective of delivering an even frequency response and tailored level distribution. To achieve an accurate prediction of sound propagation over longer distances it is critical that all aspects of a loudspeaker system are accounted for.

The d&b NoizCalc software enables system designers to model and assess noise immission issues in the far field. To ensure the results are reliable, NoizCalc includes all complex data concerning the addition and subtraction of sound waves including phase information to describe the combination and interaction effects within a loudspeaker system consisting of multiple line arrays, subwoofer arrays and delay systems.

NoizCalc displays performance characteristics for a wide area using precise geographical and meteorological data for a certain scenario. This visual representation shows the calculated system performance in the far field, enabling users to optimize for listeners while satisfying local noise restrictions and offsite regulations.

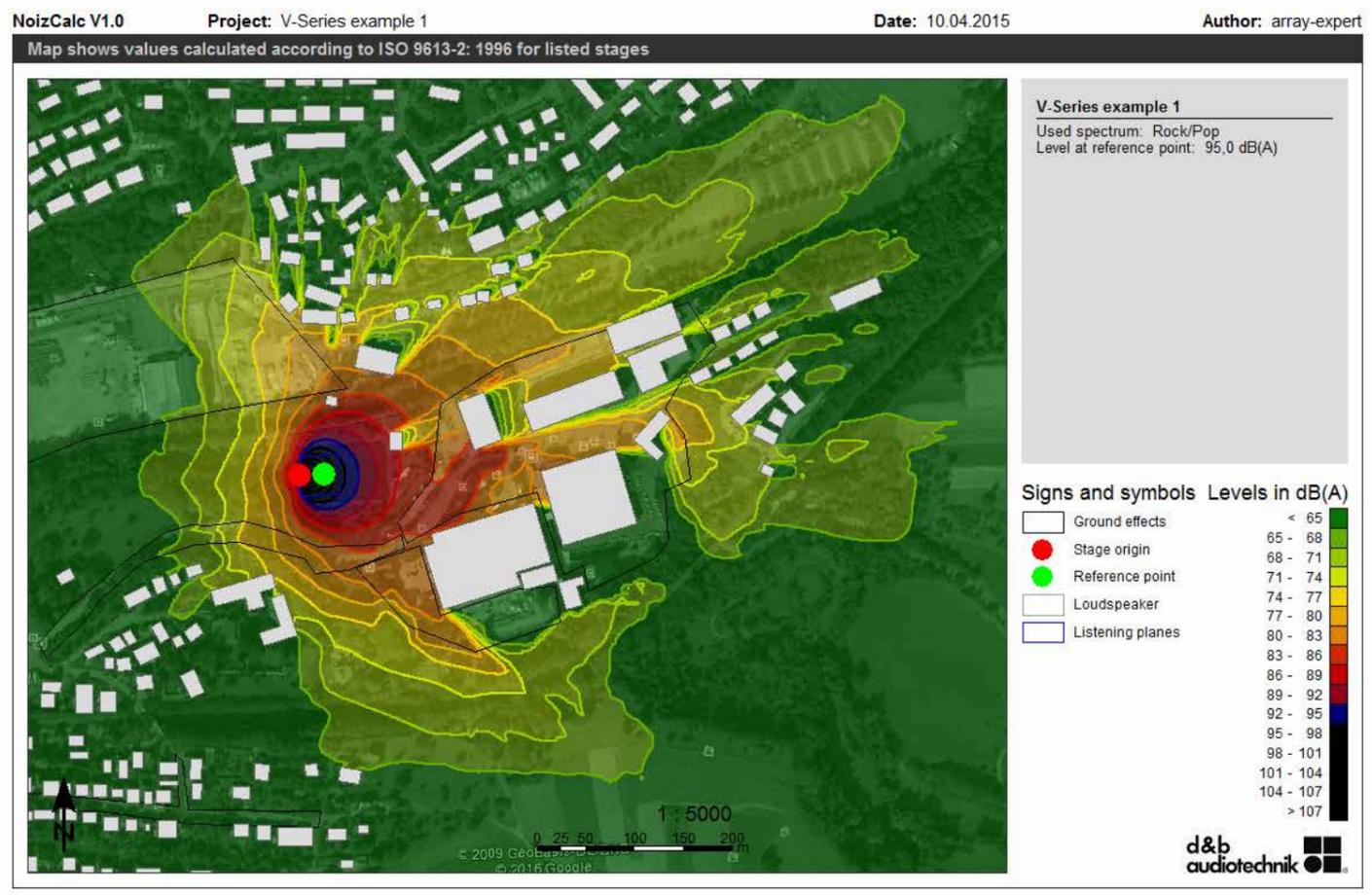
# Precision immission model.



NoizCalc models immissions in the far field according to the internationally accepted ISO 9613-2 and Nord2000 calculation standards. Ground characteristics can be set depending on the absorbency or reflectivity of surfaces, while areas with volume attenuating properties can be defined. Buildings can be included, and the maximum reflection order option adjusts how many reflections are calculated. Parameters for humidity, air pressure and temperature ensure that the correct air absorption figures are accounted for. The ISO 9613-2 standard requires limited meteorological information and assumes a worst case scenario. The more sophisticated propagation model, Nord2000 enables a more precise handling of meteorological conditions allowing the user to model with prevailing wind information.

A point can be defined within ArrayCalc as the reference for the calculated Sound Pressure Levels in the NoizCalc model to simplify verification between the measurement points and the calculated figures. In most cases, this position will be at Front of House. An emission spectrum is defined for the source to emulate the effect for different types of program material, for example rock/pop, or classical. The sound pressure spectra are stored for recall in the NoizCalc library.

# The NoizCalc workflow.



## Calculation

All complex loudspeaker data and the reference point is taken from ArrayCalc. NoizCalc then displays the modelled effects of the sound propagation and the resulting immission from the sound reinforcement system in the far field.

## Modelling

Using 3D geographical data, mitigation areas such as woodland and solid obstacles can be added and modelled. NoizCalc displays the immission on a terrain map, presenting the calculated Sound Pressure Levels in dBA applying the selected frequency spectrum using either the ISO 9613-2 or Nord2000 standards. If Nord2000 is selected, additional meteorological data including wind direction, wind speed and temperature gradients can be included in the calculation.

## Optimization

NoizCalc is intended to optimize the planning and design of a loudspeaker system. Any potential noise issues can be addressed by virtually modifying the system design, stage orientation or system settings, to achieve remarkable results for the audience with full consideration for the far field.

## Monitoring

The results map displays the calculation in the far field according to the selected standard and associated parameters. An additional time histogram prediction and monitoring positions may still be required for official purposes. The NoizCalc results map will show the sound propagation and attenuation over distance. The system technician can then monitor the level at the reference point and assess the actual results at the monitoring positions while adapting specific meteorological or spectral variations. Comparing the calculated results with the actual measurement at the reference point will indicate how the system should be adjusted to meet offsite noise restrictions.

# Two heads are better than one.



## Collaborative efforts

d&b NoizCalc was developed in collaboration with SoundPLAN, a specialist software developer for environmental noise prediction. The next version of their software SoundPLANnoise will also be able to import system data from the d&b ArrayCalc simulation software to calculate the immission from d&b loudspeakers in the far field.

SoundPLANnoise implements all common worldwide noise calculation standards and is intended for use by noise immission specialists. Both software packages use 3D digital terrain models and are based on the SoundPLAN calculation engine. SoundPLANnoise features comprehensive reporting tools to fulfill the requirements of an official noise immission statement, as requested by licensing authorities.

## The d&b audiotechnik immission mission

The collaboration between d&b and SoundPLAN forms the basis for a common understanding between those who create emissions: the loudspeaker system designers and technicians, and the environmental noise and immission specialists, who consider the impact on the wider ecology. The objective is to establish a greater awareness of all the factors which can influence solutions that conform with local and international rules and standards. The ultimate intention being to keep live events alive; delighting audiences while respecting the neighbours. Following an online registration, the d&b NoizCalc immission modelling software is available to download from [www.dbaudio.com](http://www.dbaudio.com).



