

## Monitoring

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At FRA, Fraport AG operates one of the world's most comprehensive noise and flight track monitoring systems. The system allows Fraport to determine the footprint developing from aircraft noise emissions, the pollution they cause on the ground, and to find out when an aircraft does not observe the prescribed procedures or strays from the designated flight track.

Continuously improved and refined since its inception in 1964, the measuring and monitoring system now comprises a total of 26 fixed monitoring stations, 2 mobile monitoring terminals and one noise measuring bus.

### Fixed monitoring stations

A monitoring station consists of a weather-proof microphone, a device to gauge sound levels, a data logger to keep a record of the measurement data obtained, and a modem for data transfer.



Each monitoring station complies with the DIN IEC 651 standards (for high-precision sound- level meters) and is inspected and calibrated by an independent engineer twice a year. In addition, we had the „TÜV Süddeutschland Bau und Betriebs GmbH“ technical inspection agency examine the measurements and evaluations of the noise-monitoring system in 2002. For detailed information about this examination click [here](#).

The measuring method and the evaluation of data conform to DIN 45643 (measurement and assessment of aircraft noise).

In the area of the noise monitoring points, there is noise from a multiplicity of sources in addition to aircraft noise. Therefore, certain criteria are applied to identify noise emissions from aircraft: The level of an aircraft noise event must exceed a defined maximum intensity threshold for a minimum period of time. This threshold is set depending on noise exposure from other sources at each individual monitoring point.

In addition, each noise measurement must be clearly correlated to an aircraft movement. The use of radar data largely allows for automatic correlation. However, despite automation, a manual correctness check of the correlation is indispensable to ensure that we meet the requirement of exclusively giving account of aircraft noise.

For aircraft noise events not exceeding the threshold level or not exceeding it for the required minimum period, we apply standard levels, which have been prepared in cooperation with the German Aerospace Center (Deutsches Zentrum für Luft- und Raumfahrt - DLR).

The obtained data are stored in a database allowing for subsequent computation of the equivalent continuous sound level in accordance with the Aircraft Noise Act, or for compiling maximum sound level statistics or making other special evaluations.

### Mobile Noise-monitoring Terminals

Upon request, Fraport AG makes mobile noise-monitoring terminals available to the communities surrounding the airport. Mobile monitoring terminals will be installed at locations agreed with the respective community for a period of up to three months. In terms of technology and measurement functions mobile monitoring terminals are equivalent to the fixed monitoring stations.



Noise-level measurements at the mobile monitoring terminals also apply maximum intensity thresholds to differentiate between aircraft noise and noise from other sources. As mobile monitoring terminals are often used at larger distances from the airport, the thresholds applied are usually lower than at the fixed monitoring points. Thus, an essential criterion for selecting a suitable location is the level of noise exposure from other sources.

If the maximum noise level produced by an aircraft passing by is lower than the maximum intensity threshold, the standard level applied is, as a rule, the maximum intensity threshold.

So-called observing measurements can be made, if needed for special studies requiring detailed information about noise sources. When making observing measurements, Fraport staff on site keep a record of the different measuring and flight events. Such tasks are accomplished with the noise-measuring bus.