

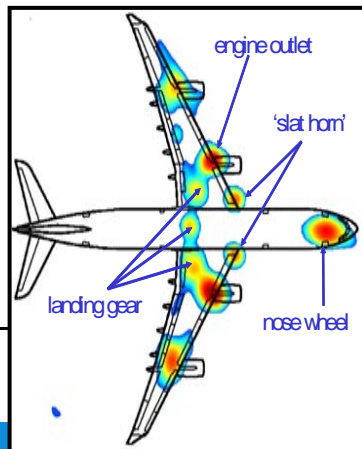
# Designing an optimal acoustic array

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## Project Overview

The total noise level as produced by aircraft stems from a number of contributions, including the engines, the landing gear and the high lift devices. Acoustic arrays are used to image these noise sources and quantify their contributions. Array measurements taken close to airports provide the required information for aircraft in real operational conditions. This information is essential for research on low noise aircraft. The arrays for these type of measurements should be limited in size to allow for quick and easy transport and installation. However, the limited size of the array can deteriorate the acoustic image. To counteract this, optimal placement of the microphones is required. The aim of the research is to establish an optimal placement of the microphones over the array. The large number of unknown microphone positions requires the use of global optimization methods, such as genetic algorithms.



## Project Goals

Within the project an approach needs to be established for determining the optimal distribution of microphones over the array. This includes the definition of the objective function and the selection (and implementation) and use of an optimization method. (Preliminary research has been carried out at ANCE, which can be used as a start for the proposed research.)

The performance of the optimized configuration needs to be compared with those of the more classic array configurations with microphones distributed along a spiral shape. The performance of the optimized array configuration should also be tested by using it for measurements of aircraft fly-overs or wind-tunnel measurements.

