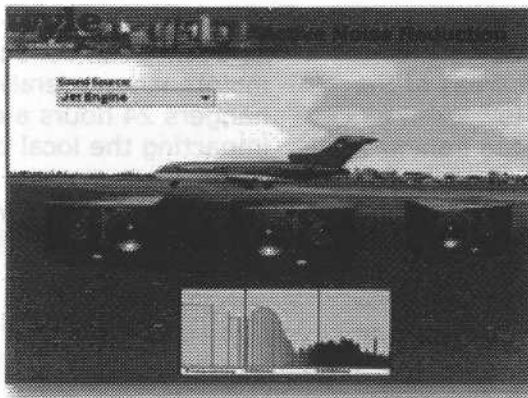


# Active Noise Reduction

*Noise from aircraft ground run-up and departure operations at commercial airports can be a continuing source of annoyance to residents living near the airport, particularly those near the ends of the runway. Barriers are sometimes erected, and sound insulation modifications applied to the residences in an attempt to reduce the impact of the noise. However, the noise generated to the rear of a jet aircraft is predominantly low-frequency, which is not well attenuated by barriers or sound insulation methods. Active Noise Cancellation uses loudspeakers to cancel low frequency noise.*

## How Does it Work?

In simple terms, an active noise control system consists of a reference microphone, that monitors the offending noise and passes it on to an electronic controller, that in turn generates an out-of-phase sound that is radiated by a loudspeaker. A second microphone, called the error microphone, is placed where noise reduction is required, and provides feedback to the controller to minimize the sound level.



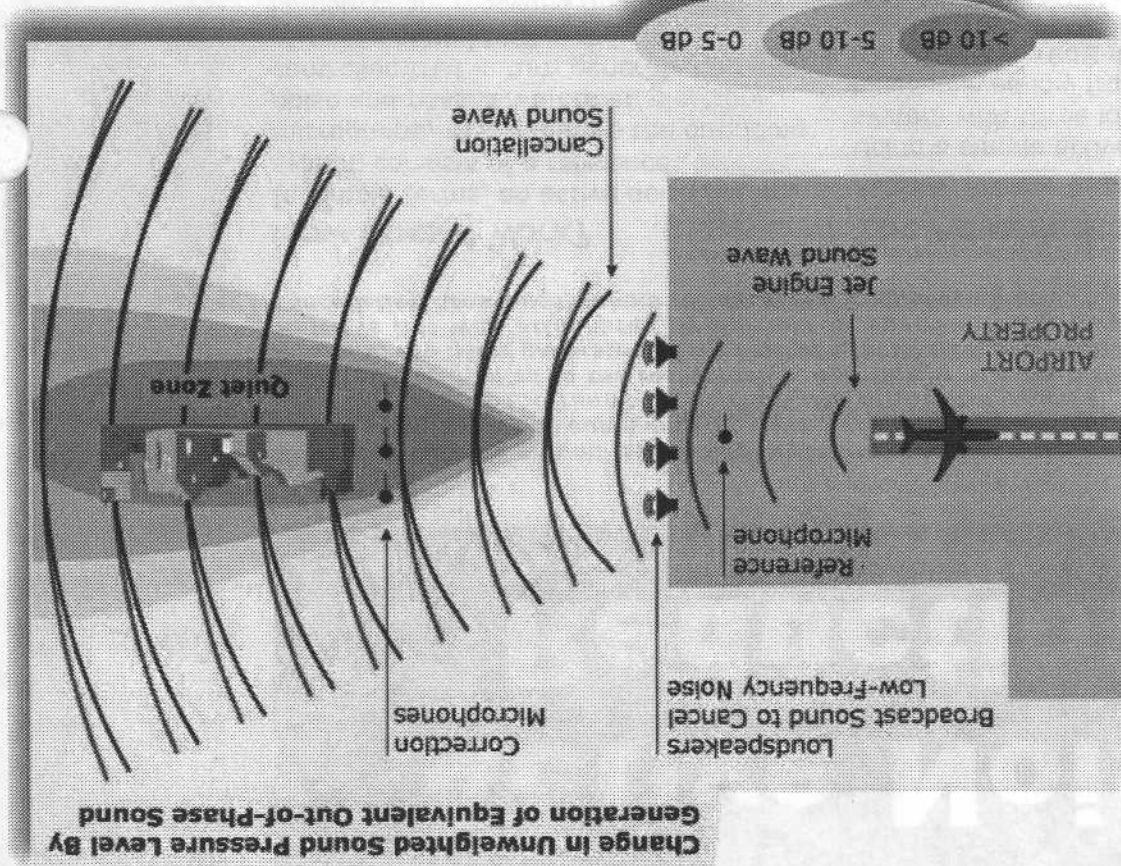
Using "active" control, sound waves are modified by electronically controlled loudspeakers, carefully placed between the offending noise source and the affected area. These loudspeakers work to neutralize the low-frequency noise by producing a continuous noise that is precisely out of phase with the offending noise.

## The Advantages of Wyle's Active Noise Reduction System

Using a simple active noise control system with three loudspeakers, Wyle has achieved low frequency noise reductions of 10dB over an area of 40,000 square feet. With further optimization of the system, comparable reductions over larger areas are expected. The system is primarily designed to mitigate stationary ground noise sources such as engine runups, but can also be used to mitigate the low-frequency noise generated to the rear of departing aircraft.

The only items of the equipment that are of any significant size are the low-frequency loudspeakers. The sound power to be generated depends on the distance of the aircraft from the site where noise reduction is required - the smaller this distance, the higher the power, and the larger the speaker assembly. In a practical assembly, these would be camouflaged as much as possible to blend in with the surroundings, and would all be at ground level. Properly adjusted, the operation of the system would not be apparent to the local community, except that noise levels would be reduced.

# ACTIVE NOISE CONTROL



## Additional Benefits

- Active Noise Reduction offers the ability to target specific areas of the community exposed to low frequency noise generated behind aircraft at the start of takeoff.
- Active Noise Reduction is less costly than a fixed run-up facility, more effective than barriers, and provides greater flexibility in the selection of run-up locations.
- Operators can conduct engine maintenance operations near their hangars 24 hours a day without impacting the local community.
- Active Noise Reduction is the next step in ground noise mitigation.

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