

# Active Noise Control

Diplomingeniør Project\*, DE5, IRS 7<sup>th</sup> Semester Projects

\*Cooperated between Aalborg University Esbjerg and Bang & Olufsen ApS

## 1. INTRODUCTION

In order to reduce the low frequency noise, the active approaches which are usually referred to as Active Noise Control (ANC) techniques have been more and more used in manufacturing, industrial operations, and consumer products. The basic idea of ANC technique is to introduce an anti-noise wave (e.g., the same magnitude and out of phase signal comparing with the original noise) through an appropriate set of secondary sources. These secondary sources could include a set of loudspeakers and a set of microphones/signal-generators and can be interconnected through an electronic system using some specific signal processing algorithms.

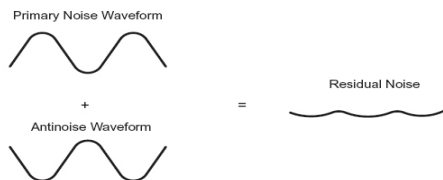


Fig.1 The principle of ANC

## 2. OBJECTIVE

The serial projects investigated the ANC design and implementation for different systems, such as an acoustic duct system emulating a ventilation system and an advanced headset system which was developed through the project so as to achieve the active attenuation of the environmental noise.

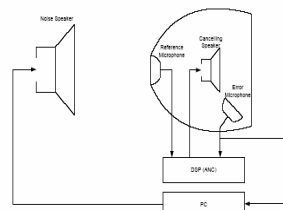


Fig.2 The advanced headset system and its principle

## 3. STRATEGY

The digital adaptive filter technique and the feedback control approach have been investigated with respect to different perspectives for different systems, respectively.

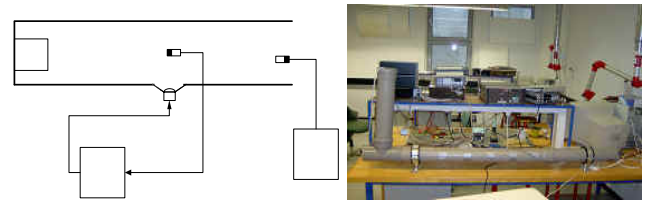


Fig.3 Feedback ANC scheme for an acoustic duct system

## 4. RESULTS

The developed ANC system worked efficiently for the noise frequency less than 400 Hz. Around 10dB reduction was observed for the best situation when we considered a CD-ROM system noise as shown in Fig.3.

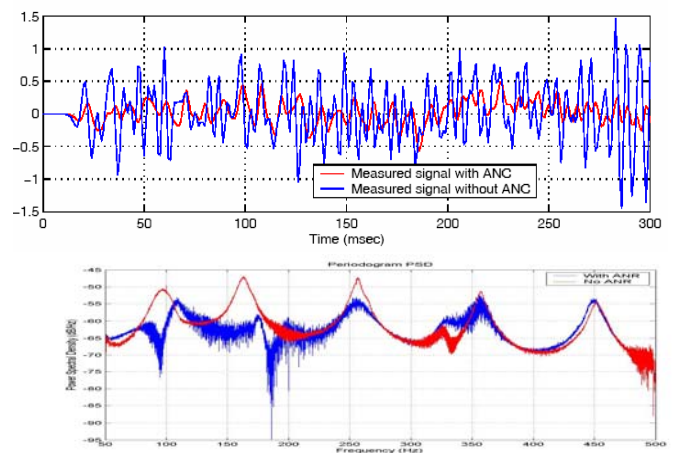


Fig.4 Some simulation and test results