



Bringing quality
to the
built environment

Factors Affecting Speech Pickup in Rooms

Objective

To investigate the effects of room acoustics and noise on the performance of devices used for speech pickup, validate existing procedures for rating them, and make recommendations to improve their performance.

Background

The performance of devices used for speech pickup (such as omni- or uni-directional microphones, and groups thereof) under real operating conditions in buildings may vary from expectations based on their laboratory ratings, due to such factors as noise, reverberation and mounting location. Research is needed to understand and help compensate for these effects.

Statement of Work

- Establish a set of physical conditions to be tested. These will be combinations of speech signal levels, noise types and levels, and reverberation levels, and will represent realistic conditions.
- Determine measurements to characterize each device selected for consideration, both in isolation and in a laboratory test room.
- Configure a laboratory test space to reproduce the physical conditions to be tested.
- Perform measurements and record test speech material for each device in each physical condition.
- Conduct listening tests by playing the test speech recordings for volunteers, who will rate them on intelligibility and other subjective qualities of the signals.

Expected Outcomes

A project report, which will:

- draw conclusions concerning the effect of noise, reverberation and mounting location on performance of the devices
- provide improved understanding of the relevance and applicability of laboratory ratings for performance in real built environments
- determine whether quality or naturalness of sound influences the effectiveness of the devices
- discuss the advantages of directional microphones or stereo pairs over omni-directional or monophonic microphones.

Partners

The Royal Canadian Mounted Police and the NRC Institute for Microstructural Sciences

Start/Expected Completion Dates

This project began in January 2006 and will be completed in March 2007.

Project Manager

Dr. Brad Gover: 613-993-7985; Brad.Gover@nrc-cnrc.gc.ca

For more information, see http://irc.nrc-cnrc.gc.ca/ie/acoustics/open/speech_e.html

Factsheet 71, March 2006



Examples of several devices commonly used for speech pickup in rooms (from top): hands-free conference phone, public-address microphone, computer microphone, clip-on lavalier microphone.