

## Noise Reduction in Communication Microphones

**Track Code:** 62110

**Categories:**

- Electrical Engineering

**Keywords:**

- Circuits
- Electrical Engineering
- Sensors
- Sound Modulation

During shuttle processing at the John F. Kennedy Space Center in Florida, several instances have been encountered where voice communications between test team members has been significantly impaired due to one or more of the test participants being required to communicate from a location with high ambient noise level. Ear protection for the personnel involved is commercially available and utilized. However, commercially available noise canceling microphones are not adequate to produce the required noise reduction for the outbound communications. Furthermore, commercially available electronic noise reducing devices have been tested and have proven inadequate.

Researchers at Purdue University have developed a method to remove noise from noise-corrupted speech signals. The magnitude of the noise-corrupted speech spectrum is averaged over multiple time frames to reduce the occurrence and amplitude of musical noise. During speech time frames, the algorithm determines which frequency subbands contain useful speech information and which frequency subbands contain only noise. The frequency subbands that contain only noise are subtracted off at a larger proportion, so the noise does not compete with the speech information. For the frequency subbands that contain speech, a large amount of noise is removed if the frequency subband contains relatively strong speech, and a small amount of noise is removed if the frequency subband contains relatively weak speech. This device will provide a high degree of ambient noise reduction for the talk path of communication circuits.

**Advantages:**

- Superior signal processing
- Less musical artifacts

**Potential Applications:**

- Circuitry
- Sound Modulation
- Devices
- Elimination of noise-corrupted speech signals

**People:**

- Kozel, David (Project leader)

**Intellectual Property:**

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