Nilesh Shah, A sensory aid for the deaf, M. Tech. Thesis, Department of Electrical Engineering, Indian Institute of Technology Bombay, 1995.

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*Abstract* - The aim of the project was to develop a single channel sensory aid for persons who have lost hearing capability in the high frequency band. The purpose of the aid would be to map the high frequency frication information to the available low frequency band. The available band is divided into two parts. In the lower part the low frequency information is presented and in the other part the high frequency frication information is mapped. An off-line implementation of the scheme had been tested earlier.

The scheme consists of processing the input speech by splitting it in two channels. Channel 1 processes the low frequency component, determines the pitch of the input signal, and provides a voicing signal indicating whether the segment is voiced or unvoiced. It generates periodic pulses for voiced segments and random pulses for unvoiced segments corresponding to low frequency noise. Channel 2 processes the high frequency component and maps them to available low frequency band. Periodic output from channel 1 is presented if the segment is declared voiced, else depending on the strength of the amplitude of channel 1 and channel 2, random pulse from channel1 or channel 2 are presented. Level of pulses is modulated by intensity in the corresponding channel.

The project involved in implementation of the above scheme in real time using a DSP board. The necessary hardware set up has been developed for experimentation and testing purpose. Listening tests were carried out to evaluate the scheme by presenting 12 consonants in VCV context. The results indicate that the above scheme helps in providing features like manner of articulation, voicing and some spectral information.