Siraj Fulum Mossa, A microcontroller based audiometer, M. Tech. Thesis, Department of Electrical Engineering, Indian Institute of Technology Bombay, 2010.

Supervisor(s): P. C. Pandey

Abstract - An audiometer is an instrument for quantifying hearing impairment. Test tones of different frequency and level are presented and hearing thresholds are determined on the basis of subject's response. In this project, a microcontroller based instrument is developed to provide two-channel speech and pure-tone audiometry with air conduction and bone conduction tests with the facilities of manual and automated test administration. Other audiometric tests like tone decay test and short increment sensitivity index test (SISI) can also be conducted. The instrument is developed using a general purpose 8-bit microcontroller as the core for all the interfaceing and data handling. A direct digital synthesizer is used for generating low distortion tones and a DSP microcontroller with internal D/A converter is used for synthesizing white noise and band-pass filtered noise. Programmable attenuations are used for level control. It provides pure tone and warble tone stimuli in the frequency range of 125 Hz to 8000 Hz and acoustic output level of 0 to 140 dB in 5 dB steps. The instrument is controlled through a 4x4 keypad and 128x64 graphic display. The subject response can be given using the response switch or through the keypad. The instrument uses an internal look-up table for relating the dB HL levels to attenuator steps as a function of frequency and can be easily calibrated for any headphone or vibrator.