

ABSTRACT

Monoaural is one of a midwife equipment that is used to detect a fetal heartbeat in the womb which is made of wood or aluminum by patching it in the stomachs of pregnant women and then the heartbeat will be heard. The sound of fetal heart then will be calculated the number of pulse per minute so can be cognizant the state of normal fetal heart rate or not. The problem that appears in detecting fetal heart rate using monoaural is long time needed to detect and understand the situation of the fetus is normal or not. In addition, monoaural could only be heard by a midwife while pregnant mothers could not listen too.

This final project realized an electronic monoaural to assist rural midwives in detecting fetal heart rate. Monoaural electronically using condensor microphones, pre-amps, LPF 1 KHz, the op-amps, microcontroller, LCD, an audio amplifier and speakers. This tool produces the sound of fetal heartbeat reinforced by the op-amp and speakers so that the midwives and pregnant women can listen. In addition, this electronic monoaural also displays the number of fetal heart rate every minute.

Experiments have been conducted on this device and can be known the reinforcement for each block. Reinforcement for pre-amp 151.42 (or 21.8 db), reinforcement for the op-amp 1.93 (or 2.8 db), reinforcement for an audio amplifier 30 (or 14.77 db) for the minimum reinforcement and 121 (or 20.28 dB) for maximum reinforcement. LPF cut-off frequency of 990 Hz is quite close to the specification. Fetal heartbeat sound can be heard either through the speaker volume that is adjustable and can be figured the number of fetal heart rate on the LCD. This electronic monoaural testing was performed on two pregnant women with pregnancy age 7-9 months.

The design and realization of electronic monoaural is expected to replace the simple monoaural without compromising the function of these monoaural and can help the performance of midwives in detecting fetal heart rate.

Key Word : Monoaural