

9

**Thesis Title**      Fetal Heart Rate Detector  
**Name**                Songpon Pokpoonkam  
**Degree**              Master of Science  
                          (Appropriate Technology for  
                          Resources Development)

**Thesis Supervisory Committee**

Kanit Sa-nguantrakul, M.Sc.

Sukhum Phutong, M.Sc.

Piroj Suvanasuthi, M.Eng.

**Date of Graduation**

4 January B.E. 2536 (1993)

**ABSTRACT**

The objective of the research is to produce a fetal heart rate detector as a prototype for fetal heart rate measurement. The instrument is designed on the basis of doppler effect method. Most component of the instrument can be purchased within the country; therefore, the cost of this instrument should be cheaper than the imported one (Terumo UTD-7) but the quality is the same as the imported instrument.

Normally doctor can measure fetal heart rate by simple equipment (Stethoscope) which is difficult to hear fetal heart rate but this instrument can be used to detect the fetal heart rate clearer than stethoscope.

When this instrument is operated the oscillator will generate ultrasonic frequency around 2 MHz and transmitted through the transducer which directly radiate to the fetal heart blood. The ultrasonic signal and heart rate signal will beat each other and amplitude modulation signal will be generated. The signal will reflect back to the transducer and receiver (receiver section).

The received signal will be amplified and pass through the detector circuit which the detector filter out the ultrasonic signal through ground and the heart rate signal will be passed to the next stage of amplifier.

The test resulted has shown that the prototype instrument has the same performance as Terumo UTD-7 at the level of confidence 0.05 but cheaper than Terumo UTD-7.