CHAPTER 1

INTRODUCTION

1.1 Background

Human, animal or anything can produce sound. This sound is creating by the physical movement whether the movement is fast or slow depends on the medium that create the sound. Eventually these movements can be detected by using an ultrasound sensor. Ultrasonic sound waves are sound waves that are above the range of human hearing and, thus, have a frequency above about 20,000 hertz. Any frequency above 20,000 hertz may be considered ultrasonic.

An ultrasonic sensor typically comprises at least one ultrasonic transducer which transforms electrical energy into sound and, in reverse, sound into electrical energy, a housing enclosing the ultrasonic transducer or transducers, an electrical connection and, optionally, an electronic circuit for signal processing also enclosed in the housing. Ultrasonic sensors have typically been used in applications such as detecting and identifying solid objects, measuring the shape and orientation of a work piece, detecting possible collisions between objects to avoid the collisions, room surveillance, flow measurement, and determining a type of material by measuring the absorption of sound.

By combining parts of electronic to the ultrasonic sensor it become an ultrasonic motion detector. A motion detector is an electronic device that detects the physical movement in a given area and transforms motion into an electric signal. The motion detector may be electrically connected to devices such as security, lighting, audio

alarms. Motion sensors are used in a wide variety of applications. Motion detectors are mainly used in for security systems.

Now days in the market there are many kind of ultrasonic motion detector sell, basically this project is to design an ultrasonic motion detector use to detect physical movement of human, animal, or anything that move. The design is to improving the use of sensor in detecting motion. Also to reduce the cost to built an ultrasonic motion detector.

1.2 Objective

This project is design aim and objective is to:

i. To design a circuit that sense motion through movement of anything
ii. The circuit can be use to trigger another circuit whether to on or off depending on the circuit attach to it
iii. The design will be a low cost portable motion detector

1.3 Scope Project

This project is widely use depending on situation and places. For this project it is design to meet the following scope

i. Movement will be detected within the coverage area about ±4m.
ii. Total beam angle of transmitter and receiver sensor 45º
iii. The area of the room is 35m²
iv. Condition of room is solid wall

1.4 Thesis arrangement

To complete this thesis, I must completed 6 requirements which are Introduction, Literature Review, Hardware Design, Software Design, Result and Discussion, and the last chapter is a Conclusion and Further Development of the project.

Chapter 1 is about the introduction of the project. Basic idea of the project, the objective and overall view about the project

Chapter 2 is about the literature review about the component that is use in this project. This section contains the literature review and the methodologies that have been collected from different sources for the development of the ultrasonic motion detector

Chapter 3 is about the design and methodology of the project. General concept of the project like the component that have been use to the project

Chapter 4 is about the simulation of the circuit. This chapter will explain the concept idea of simulation.

Chapter 5 is about the analysis all the result and the limitation barrier in completing this project.

Chapter 6 it consists of the conclusion and further development of the project.