ULTRASONIC PEST REPELLENT

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ABSTRACT

The project is about an ultrasonic pest repellent. The device is compact, cheap, and it does not cause any pollution unlike the other chemical repellents. This product repels pests by emitting high frequency and short wavelength sound waves that are too high in pitch for humans and even some animals to hear. The circuit is simply a 555 timer IC connected as a square wave generator. Its base frequency is approximately 45 kHz, but the user can vary the range of frequency by manipulating the input voltage by using potentiometer. An addition of component which is Arduino UNO make the project is different than other ultrasonic pest repellent because we programmed the Arduino to on 3 different colors of LED which indicates the range of frequency. The range of frequency is monitored since there are different pest using different range of frequency. Different range of frequency also will cause different reaction of pest's behavior since the received sound signals are dissimilar. In this project, data from theoretical, simulation and experimental are collected and analyzed.

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CHAPTER 1

INTRODUCTION

1.1 BACKGROUND STUDY

Do you know that the electronic technology is used to repel insect has become more important to people in this world? It is become so important because it is help people to kill insect in their house, office, school, work place and so on [1]. Insects were a big problem to the human in real life. There are many type for controlling insects such as trapping, glue boards and toxic bait where the function to kill and dispose the insects that infest our home. Those methods can be done but unfortunately, it will also make the human being in danger. Therefore, other method that is much safer to human being is needed to repel those insect away from our area. In this project, ultrasonic was chosen to rid insects.

In medicine field, ultrasonic sensors are used to detect shapes and sizes of otherwise internal body parts [2]. Furthermore, doctors can determine gender of a foetus in the womb of its mother. Besides that, ultrasonic sensor is also used to observe wind speed and direction. But in real life, ultrasonic usage is not very familiar to drives the insects away. Ultrasonic insect repellent work by emitting high frequency and short wavelength sound waves that are too high in pitch for humans and even some animals to hear [3]. The high pitch sound the can be heard by special hairs known as the sensilla on insects, usually located on the antennae, organs or other insect body parts. Exceedingly sensitive organs called sensilla are concentrated in organs of hearing. These can be found on the bushy antennae of the male mosquito or tympanal organs in the front legs of crickets [4].

These high tech devices emit frequencies that range from 30 kHz to 55 kHz, which is ideal to drive the insect insane. The range of frequency is the important factor deciding the type of repellent. Insects do not react at the same ultrasonic frequency. Some insects get repelled at range 38 kHz to 40 kHz and also at 35 kHz.