



Ultrasonic Frequency Against Flies

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Introduction:

The purpose of the project is to design an ultrasonic insect such a device can be very useful to counter various problems caused by insects like mosquitoes. The device is compact, cheap and it does not cause any pollution unlike the other chemicals repellents. We have used an IC555 timer to produce signal on its output pin which the output is converted to ultrasonic frequency by piezo buzzer with the power supply of 9v or the solar panel. The technical details of this project follow later. The circuit has been experimental tested on flies (mosquitoes) and it has been successful in repelling them through the generation of ultrasonic frequency sound.

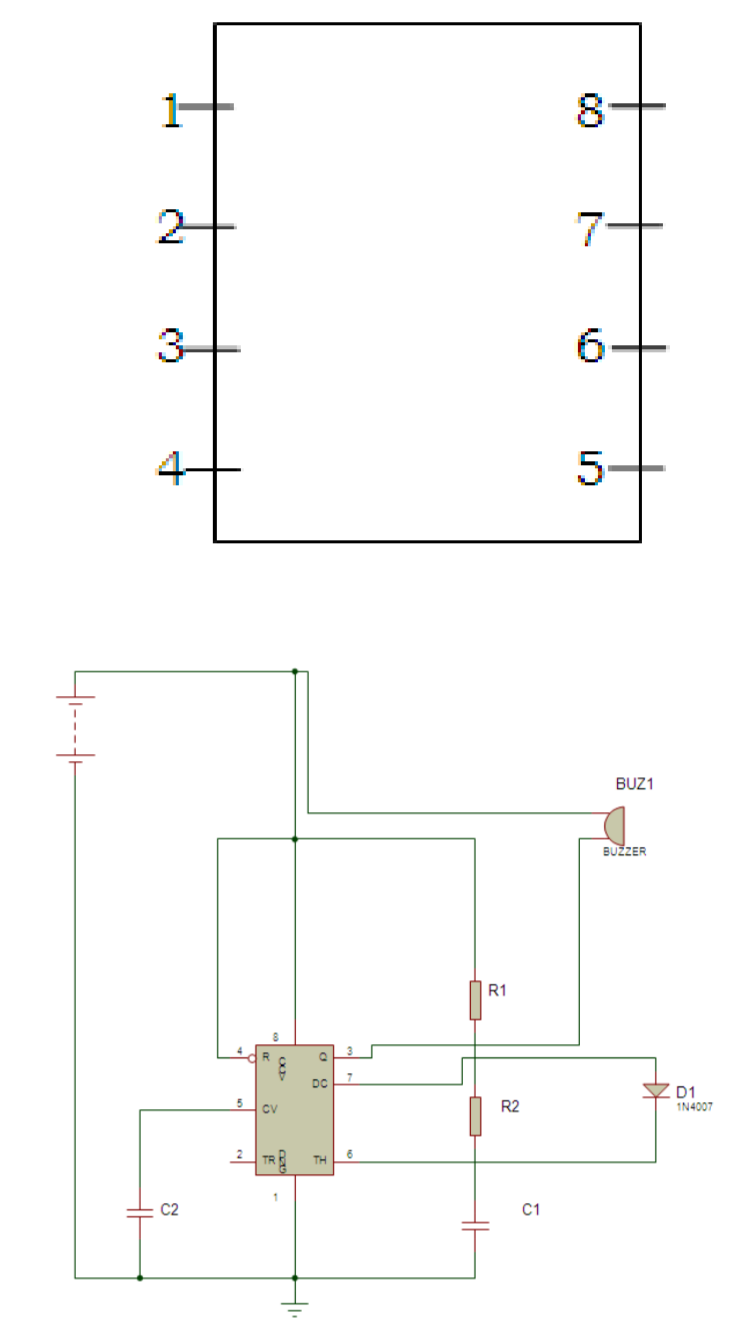


Method:

We are using the 555 timer as astable multi-vibrator mode. To generate a sound at ultra-frequency level. The timer consist of 8 pin

A stable multi-vibrator

We can also connect the 555 timer IC in an a stable mode to produce a very stable 555 Oscillator circuit for generating highly accurate free running waveforms whose output frequency can be adjusted by means of an externally connected RC tank circuit consisting of just two resistors and a capacitor. This triggering is basically achieved by connecting the trigger input (pin 2) and the threshold input (pin 6) together, thereby allowing the device to act as an a stable oscillator. Then the 555 Oscillator has no stable states as it continuously switches from one state to the other. Also the single timing resistor of the previous mono-stable multi-vibrator circuit has been split into two separate resistors, R1 and R2 with their junction connected to the discharge input (pin 7) as shown aside.



Results:

The experiment has been done by taking three samples of ultrasound frequencies in order to discover their effects and relation with other parameters like a distance coverage, strength of the signal and the time take include initial time.

The following table shows the specifications of the samples that taken during our design and testing.

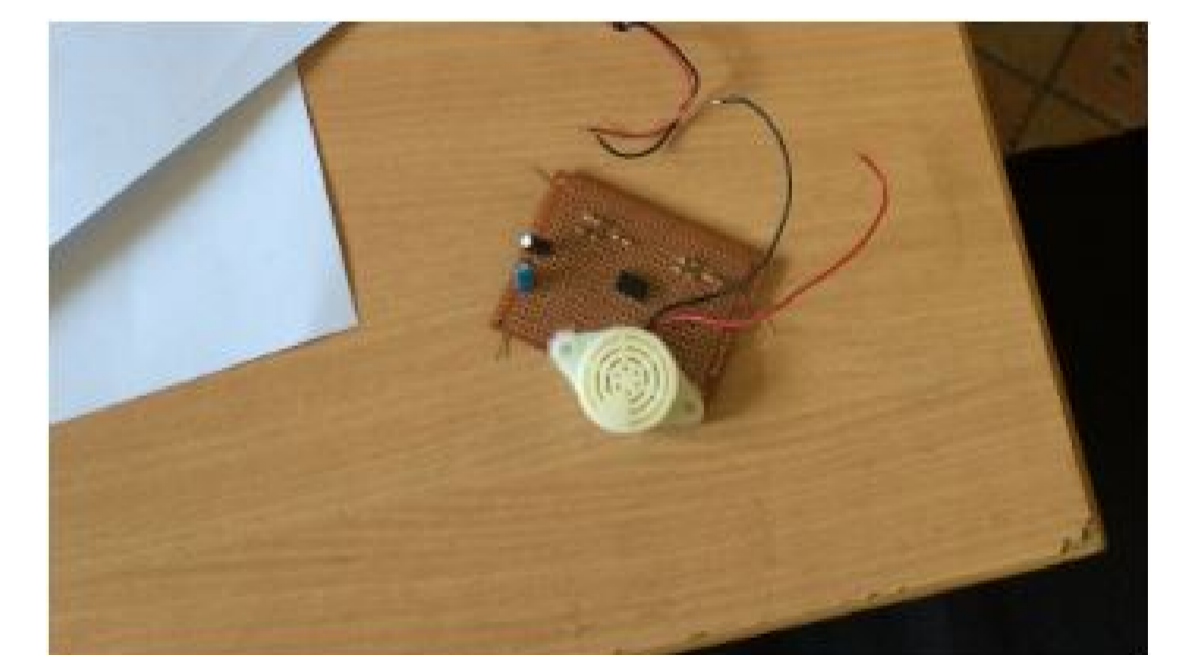
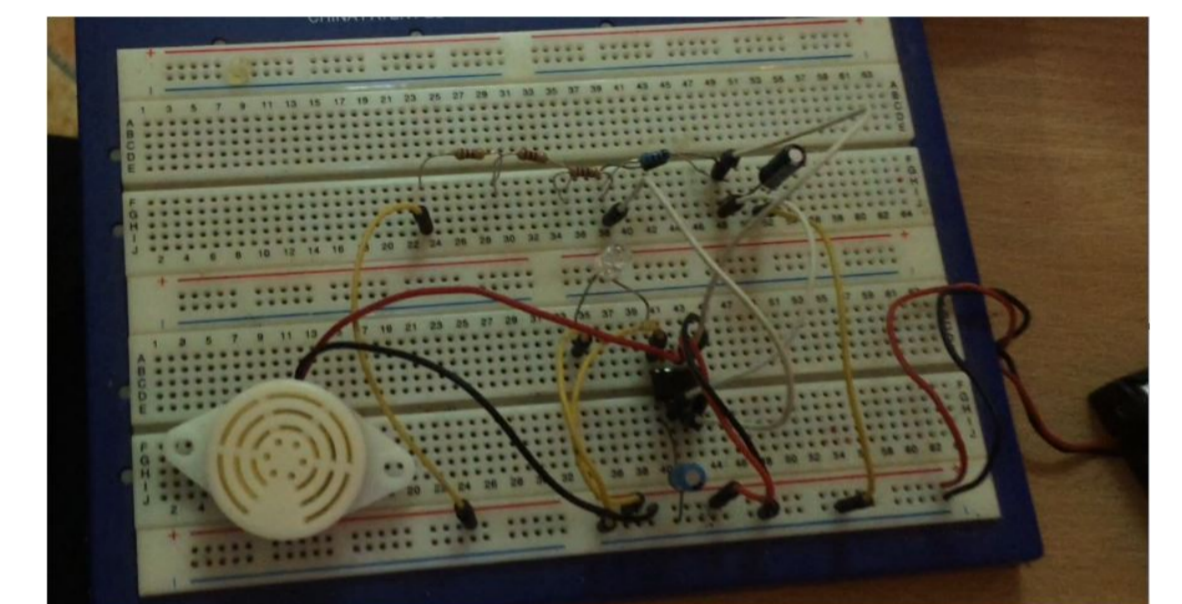
Parameters	Sample 1	Sample 2	Sample 3
Resistor, R1 (kΩ)	120	150	190
Resistor, R2 (kΩ)	120	150	190
Capacitor, C (μF)	0.1	0.1	0.1
Ultrasound Frequency (kHz)	60	48	38

SAMPLE 1

Sample 1 has been tested by connecting the parameters values as shown in the Table 1 to produce the need ultrasound frequency of 60 KHz to generate this frequency the formula below is used to calculate the resistance

From the formula the resistance can be calculated as shows the process below, during the calculation the value of R1 and R2 is same according to our designation, With that, $R_1 = R_2$.

The result of this project is that mosquitoes were repelled due to the production of high frequency (ultrasonic frequency) of 38 – 50kHz. The frequency generated create stress on the nervous system of insects and jam their own ultrasound frequency. Hence it immobilize the insects and they escape from the source of ultrasound.



Conclusions

Conclusively; ultrasonic frequency against flies (mosquitoes). This high frequency of 38 – 50kHz repels mosquitoes since ultrasound sensors are present in the antennae of mosquitoes, and insects detect sound by special hairs or sensillae located on the antennae so when these frequency generated mosquitoes move away from the source. This device is safety to be used in any environment at schools, offices, hospitals, hostels and it also safety to be used by pregnant women. Human being cannot hear these high frequency and it is also safety to children because children can hear the ultrasound up to 30kHz and our device use the frequency of 38 – 50kHz so it is safety to all people and it is experimental tested.

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Acknowledgments

We put the name of **ALMIGHTY ALLAH** above every which deserves a space in this acknowledgement for his blessing and guidance that have always been with us.

In the project we received right hand support from Karume Institute of Science and Technology from improving the device.

Also our physics teacher Mr. Moh'd Muhsin for their school teaching, and Mr. Ali Othman for Techno solution company and Mr. Nassor from Zanzibar Malaria Elimination Programme and Mr. Issa Massoud Hamad for his guidance and support.