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A Stable, Low Cost Mobile Phone Detector

Akhil Saji[1], Vishnu T[2]
[1,2]*Student, Taliparamba Arts & Science College Kanhirangad, Kannur, Kerala, India.*
Corresponding Author: Akhil Saji

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ABSTRACT: This pocket-size mobile phone detector can sense the presence of an activated mobile phone from a distance of two to four meters. It can be used to prevent the use of mobile phones in prohibited areas. The moment the circuit detects a radio frequency signal, it starts sounding an alarm and the LED blinks. Objective of this study to develop an inexpensive cell phone detector for a small area.

KEYWORDS: Mobile phone detector, RF transmission, Electromagnetic wave, Op-Amp.

I. INTRODUCTION

Mobile phones are dominant transmission gadgets invented by Motorola in 1973. They use radio frequency in the range of 700 to 2600 MHz, which is high frequency with enormous energy (Shon, 2006). In recent years, the use of mobile phones has rapidly increased. Along with many uses, there are still challenges that mobile phone use can pose, such as exam fraud and classroom distraction (Styron & Ronald, 2010; Nyamawe & Mtonyole, 2014). Many colleges and organizations use the help of expensive cell phone jammers, which prevent everyone from being in this area and also emit high-frequency radiation. Therefore, this study focuses on developing and testing a stable and inexpensive cell phone detector for a small area.

II. METERIALS AND METHODS

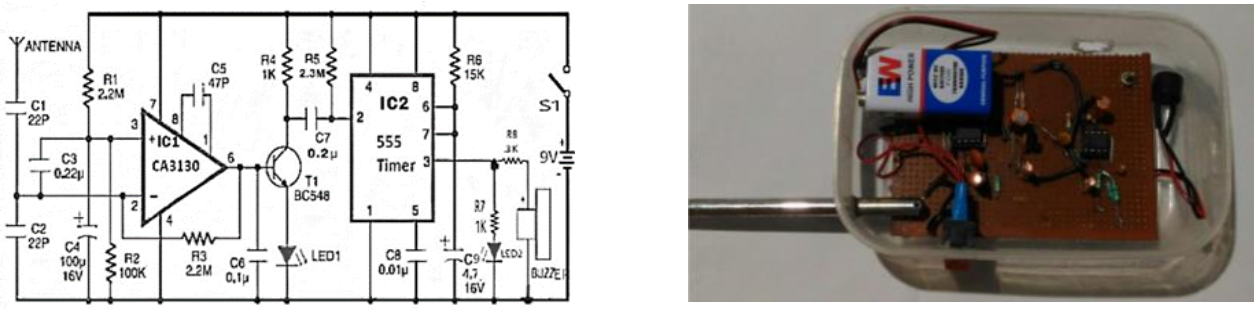

Fig.1 (a) circuit diagram and (b) finished circuit of mobile phone detector

The circuit consists of two main parts, IC1 (integrated circuit) acts as a differential amplifier and IC2 acts as a monostable multivibrator (Gayakwad, 1983; Bell 2008). In this circuit (Fig.1) capacitor (C3) is used to obtain signals from the antenna. When considered a capacitor can also store energy from an external source and can oscillate and discharge current like an LC circuit. This small current is carried to the input of C1. IC1 converts current to corresponding voltage. For keeping non-inverting input stable the C2, C4 and R1 are used. C4 is discharged through a resistor, R2. R3 acts as a feedback resistor. Depending on the signal from C3, the output of IC1 is an alternating current, which causes LED1 to blink. Inverting and non-inverting terminal (PIN 2 and 3) connected C3, working as a loop antenna, on-inverting input is connected to the potential divider R1&R2. As the C1 gets charged both the input of IC1 get equal voltage, thus the output current is zero. C5 is used for phase compensation. When the signal is sensed by the C1, it releases the stored charge to the input of IC1 and its output goes high gradually. At the output of IC1, the transistor (T1) works as a switch. C6 is used as a noise filter, to filter the output of IC1 for fast switching. IC2 triggering through C7. To guide the duration of alarm and blinking of LED 2 R6 & C9 were used. The trigger goes low, then the output becomes high. When the output becomes high, then the buzzer will ring and LED2 glows.

III. RESULT AND CONCLUSION

The mobile phone sensor can sense the presence of an actuated mobile cell phone from a distance of 2 meters. When the distance increases the delicacy decreases. It's duly working with 2G, 3G bands but isn't detected the 4G, Bluetooth and Wi-Fi signals. The battery drainage observed was high. The difficulty can solve with efficient Op-amp. As compared to the overall cost i.e., 150 INR, the product was cost-effective.

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