

# MOBILE PHONE DETECTOR

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## Abstract:

Cell phones are widely used in the world. While people have to be connected to one another, there are situations or places where their usage is to be prohibited either due to security reasons or it may cause health hazards. Cell phone detection has been on investigation for a long time. There are techniques which have been formulated or proposed on how cell phones can be detected. Most of them use the features such as audio system, RF system and common materials of the phones and try to look into how they can be used as basis to detect mobile phones. This project utilizes the RF system of the cell phone as the feature to be used to detect its presence. A circuit that detects signals of the range 0.9GHz to 3GHz is used to detect a cell phone when in use. When the signal is detected, an LED blinks to indicate the usage of a cell phone within a radius of 1.5metres.

Keywords: Cell phone, LED, RF system.

## 1 INTRODUCTION:

Cell phones have become an integral part of people's lives. They are not only used for communication via short messaging service (SMS), calls, emails and internet but advanced applications such as remote health monitoring systems and security systems have been integrated with mobile phones. The recent years have seen rapid advancements in the value addition applications in mobile phones such as high definition cameras and high speed internet connectivity. The country has also experienced developments in the infrastructures to support the rising need of faster internet connectivity. Safaricom rolled out their 4G internet infrastructure which is now available in over thirteen towns in the country.

Despite the advantages enjoyed by these advancements in mobile technology, there are threats that have been posed by their usage. Company data mining has been a big threat in the industry where employees are able to access sensitive company information and share with the competitors. This led to the development of cell phone jammers where signal reception is completely blocked when you enter the premises. Despite personal privacy invaded by the usage of such devices, this could not put to an end the vice since mobile phones could be connected to the computer and information transferred and sent when the employee is out of the company premises. Criminal activities and attempted escape incidences have been organized by inmates in correctional institutions through the use of mobile phones in such facilities.

The most common incidence in the country is when people were conned by inmates who impersonated promoters and required winners to send money as fees to facilitate the award of prizes. Life support machines are also sensitive to the use of mobile phones. The use of mobile phones in such a facility leads to adverse repercussions to the life of persons whose lives depend on the proper functionality of the machines. Other places are Airplanes, petrol stations, conference halls, examination halls, worship centers, etc. where the use of mobile phones can either lead to failure of sensitive machines or is a nuisance.

## **2 PROBLEM STATEMENT:**

The University has a “NO mobile phone in examination halls” regulation. Students undergo frisking as they enter the examination venues by invigilators. Frisking is gender sensitive and people feel that their privacy is infringed. It is beyond one's imagination of what can happen when there is no female staff to frisk the female students which is mostly the case in the school of engineering.

This is not saying that only female students are prone to carry their mobile phones into the examination halls but it opens doors for gross irregularities as the contents of these gadgets can be easily shared via messages and Bluetooth.

## **3 PROBLEM JUSTIFICATION:**

Despite frisking of students before they enter into examination halls, some manage to smuggle mobile phones into the halls. Mobile phone usage in examination halls opens doors to examination irregularities as most phones have high definition cameras and can read PDF documents therefore class notes are easily accessed during the examination.

The same can also be shared via Bluetooth, Wi-Fi and messaging. Due to this problem that has been experienced in the university for years, there is a need to design a system that can detect the presence and usage of mobile phones in the examination halls. This paper is therefore aimed towards designing a cell phone detector that will be installed in the examination venues. This will curb the vice because even though some may manage to smuggle them into the halls, their usage and presence are continuously monitored by the system and offenders can be caught. This detector is not limited for use in examination halls only. It may be used in hospitals, conference halls, correctional institutions and other places where the use of mobile phones must be prohibited.

## **4 MAIN OBJECTIVES:**

The main objectives of this project are to:

Design a circuit that can detect signals in the range of 0.9GHz to 3GHz.

Produce a notification when the signal in the range of 0.9 to 3 GHz are detected.

Design a circuit to detect signals within a range of one and a half meter.

## **5 SCOPE OF WORK:**

This paper is limited to the detection of a cell phone that is in use; on call, communication via short messaging service and internet access. The detection of cell phones that are on standby mode, switched off or on airplane mode will not be

### 5.1 Implementation Design:

#### Block Diagram:

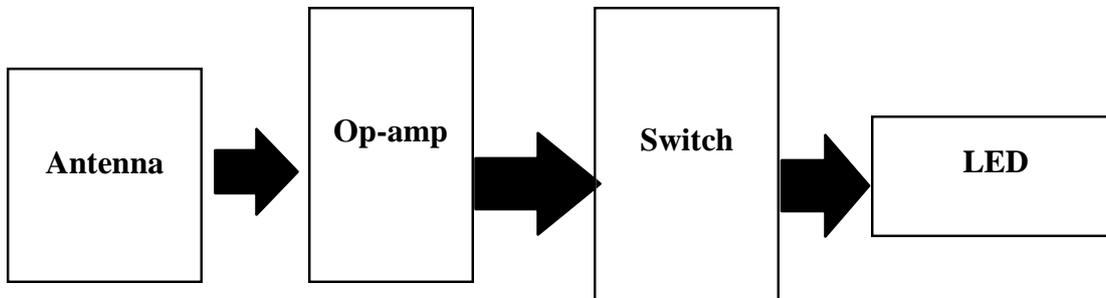


Fig 1 : Block Diagram of mobile

### 5,2 Complete Circuit:

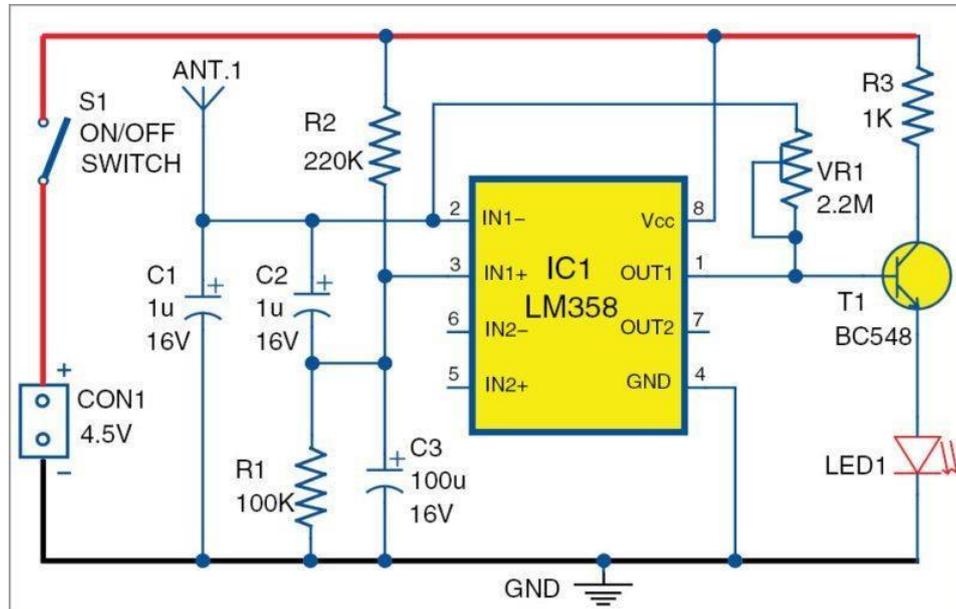


Fig 2: Circuit Diagram of mobile phone detector.

The complete circuit for the cell phone detector is given in figure above.

### 6 RESULTS:

The monopole antenna detects the RF signals from the frequency ranges of mobile phones and gives it to the 2.2 micro farad capacitor. This capacitor stores the signals and discharges to the op amp LM358. This op amp acts as a comparator. It compares the input voltage with the reference voltage of about 5v if the input voltage is greater than the reference voltage this is passed through the output pin of the IC. This values is then passed out to the transistor BC548 where the transistor acts as switch and allows the voltage to pass through towards the led and the led glows.

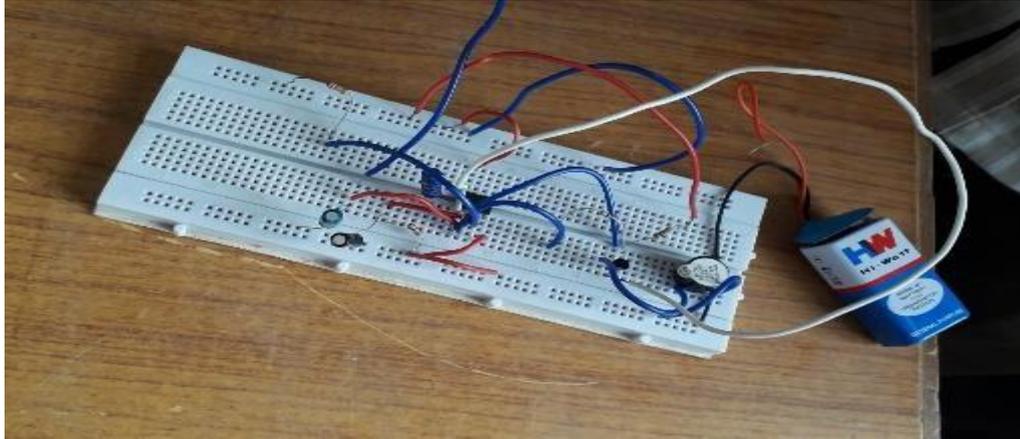


Fig 3 :Circuit showing the absence of mobile nearby.

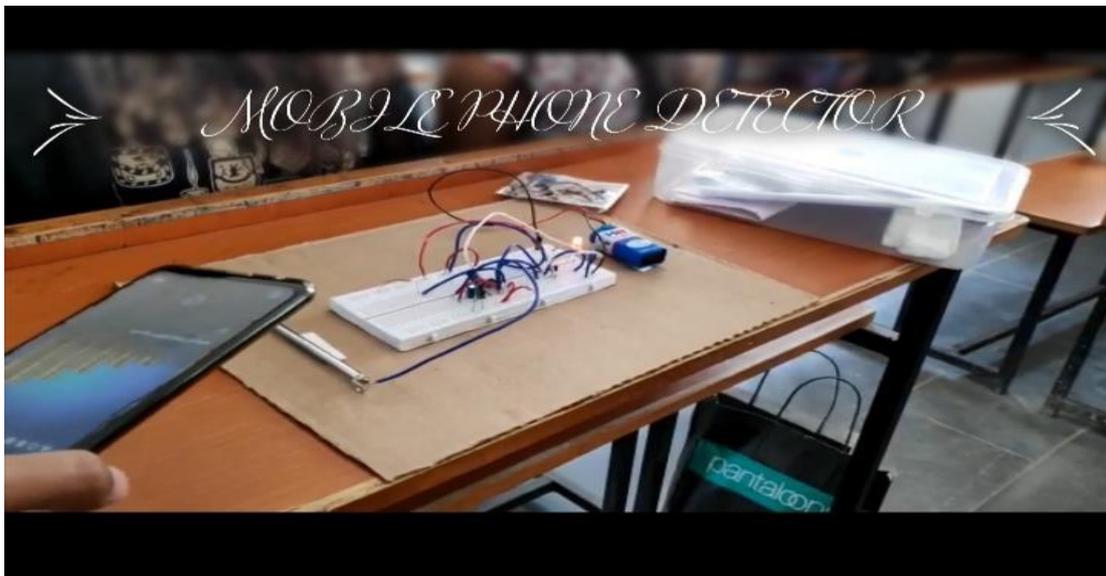


Fig. 4: Design detecting nearby mobile

## 7 Conclusion and Future Scope:

The results as obtained show that the cell phone detector worked sufficiently. The detector could detect the signal in the frequency range of 0.9GHz to 3.0 GHz thus a cell phone that is in use. This phone usage was indicated by the blinking of the LED. When a cell phone is on standby mode, it keeps a radio silence therefore cannot be detected using this cell phone detector. It can be concluded that the project was successful. This detector can therefore be used to track the usage of a cell phone in an examination room where a buzzer usage will be too loud and disturb the examiners.

The following are recommended to improve the functionality of this cell phone detector: -

- Increase the range of the detector.
- Incorporate a buzzer to sound an alarm when a cell phone in use is detected.
- Use of microcontroller to improve the detector.
- Make the LED go off until a cell phone is in use.
- Improve the detector to be able to detect even cell phones on standby mode.

### 8 References:

1. Berkeley Varitronics Systems, Inc. (2016, March) Wolfhound-PRO Cell Phone Detector. [Online]. <https://www.bvsystems.com/products/>
2. RM Pratt et al., "Cell Phone Detection Techniques," TN, Prepared for the US Department of Energy October 2007.
3. Deshpande Tamvi and Jadhav Nakul, "Active Cell phone detection and Display using Atmega-8 Microcontroller," *IMPACT: International Journal of Research in Engineering & Technology (IMPACT: IJRET)*, vol. 3, no. 8, pp. 21-24, August 2015.
4. Nicholas W. Scott, "Study of Cellular Phone Detection Techniques," University of Nebraska, Lincoln, MSc Thesis 2011.

