

Mobile Detector

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Abstract - The handy, pocket-size mobile transmission detector is used where the use of a mobile phone is strictly prohibited such as examination halls, confidential rooms etc. The cell phone detector circuit can sense the presence of an activated mobile phone from a distance of one and a-half meters. Even if the mobile phone is kept in the silent mode, the circuit can detect the incoming and outgoing calls, SMS and video transmission. The moment the bug detects RF transmission signal [1] from an activated mobile phone, it is detected and notifies the authority. The transmission frequency ranges 0.9-3 GHz. The use of mobile phone for spying and unauthorized video transmission can be easily detected.

Key Words: RF signal, Frequency detection, Comparator, Arduino programming, Cell phone, Android application.

1. INTRODUCTION

Mobile phones have become an inevitable part of people's day-to-day life. They are used for communication via short messaging services, calls, emails, and internet but also for the advanced applications such as remote health monitoring systems and security systems have been integrated along with mobile phones. The use of mobile phones leads to unfavorable consequences to the life of persons whose lives depend on the proper functionality of the machines. The use of mobile phones can either lead to failure of machines or is a nuisance in some places such as airplanes, petrol stations, conference halls, examination halls, worship centers, etc. Therefore it is necessary that the usage of mobile phones in some places must be prohibited. We can use several methods to restrict the unauthorized usage of the cell phones. They are cell phone jammers, cell phone detectors etc. But due to the privacy laws that limit the usage of these cell phone jammers, cell phone detectors must be designed and installed so that in case a person gets in with a phone into restricted area, they can be informed and either told to switch them off or take them outside. The cell phones detectors continually scan for the presence and usage of the cell phone and sound an alarm to inform the authority or security personnel. So it is more efficient and effective technique for the detection phase.

The rest of the paper is organized as follows. Detailed plan of proposed system is included in section 2. Experimental results are presented in section 3. Concluding remarks are given in section 4.

2. PROPOSED SYSTEM

The presence of an activated mobile phone from a distance one and a half meters can be sensed using the mobile detector. So it is designed as a handy device for the easy carrying and usage in an examination hall or meetings where mobile phones are fully prohibited. The incoming and outgoing calls, SMSs, internet and video transmissions are detected by this technique even if a cell phone is kept in silent mode. The radio frequency that radiates out from a cell phone is any of the electromagnetic wave frequencies that lie in the range extending from around 20 kHz to 300 GHz, roughly the frequencies used in the radio communications. When the detection of the RF signal from an activated mobile phone is done, its LED starts blinking and continues to blink until the signalling stops. Simultaneously along with the detection phase, the notification message is also transferred to the authority in charge of security via android mobile application. The detection and message transmission through android application are described below.

2.1 Frequency Detection

The mobile phones frequency ranges from 0.9 to 3 GHz and with a wavelength of 3.3 to 10 cm are used the detection. Thus a circuit detecting GHz signals is necessarily required for the mobile bug. The lead length of the capacitor is fixed as 18 mm with a spacing of 8 mm between the leads to obtain the required frequency. The disk capacitor used along with the leads acts as a small GHz loop antenna to collect the RF signals that radiated from the mobile phone.

When mobile phone is in active mode, it means that radiation signal is transmitted out in the form of sine wave which passes through the space. The receiver in the base station captures the encoded audio/video signal contains electromagnetic radiation. The modern 2G antenna in the base station has the transmitter power of 20-100 watts. The short signals that are transmitted by the mobile phones at regular intervals is used to register its availability to the nearest base station. The most important environmental factor is the distance to cellular base station. Generally, the nearer a cellular phone is to a base station or transmitting tower, the signal will be weaker that needs to come from the phone. The frequency range of the detector is usually identified by using a comparator. Here we use LM358 comparator.

The huge amount of electromagnetic energy is carried by the high frequency RF wave in the micro wave region that is generated by the mobile phone.

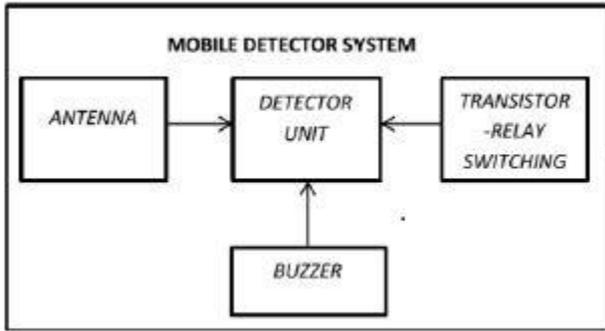


Fig -1: Detection unit

2.2 Message Transfer

During the detection process, RF signal from an activated mobile phone is detected continuously and its LED starts blinking. It continues to blink until the signalling gets inhibited. Simultaneously along with the detection phase, the notification message is also transferred to the authority in charge of security via android mobile application[4], which is connected to the Wi-Fi module in the detection unit.

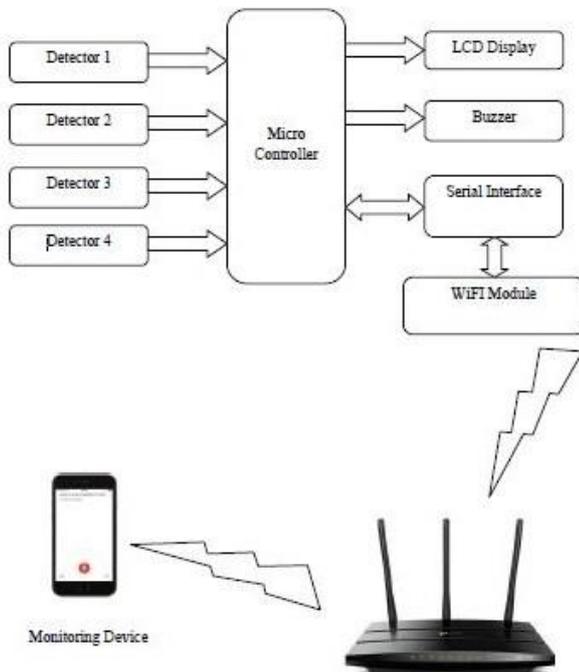
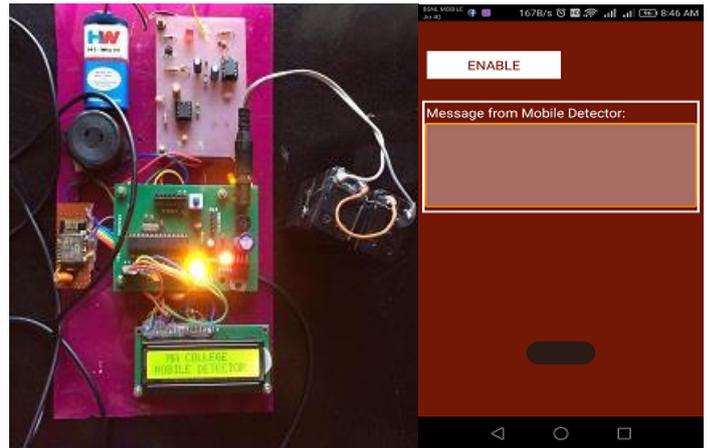


Fig -2: Block Diagram of the main unit

3. EXPERIMENTS AND RESULTS

The circuit detects the RF signal emitted from the mobile phone and if the signal detected is a mobile activated signal, then the notification message is displayed in the LCD monitor in the circuit board[3] and message passed to the app. The app installed mobile is connected to the Wi-Fi module and the passed message is displayed in the app also.



(a) (b)

Fig-3: (a) Circuit in initial stage. (b) Screenshot of mobile application at initial stage.

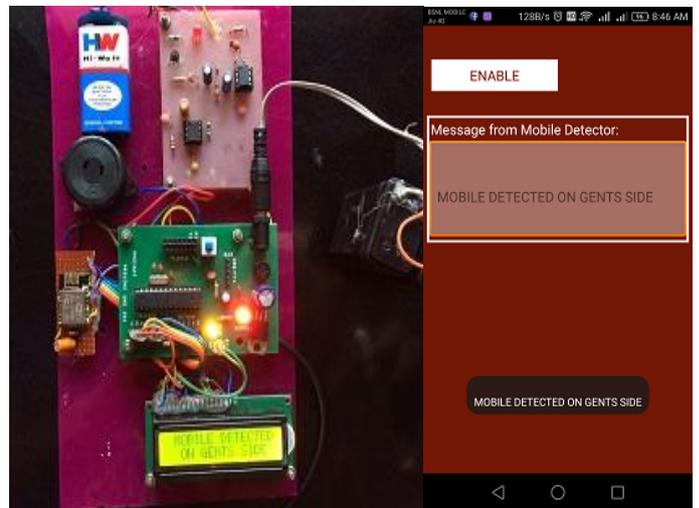


Fig-4: (a) Detection at Gents side. (b) Screenshots of mobile application when detection at the Gents side.



(a) (b)

Fig-5: (a) Detection at Ladies side. (b) Screenshots of mobile application when detection at the Ladies side.

4. CONCLUSIONS

In today's scenario as the advancement in technology is increasing the misuse of it also growing. These problems can easily be avoided by using a cell phone detector. The mobile detector is a cheap technology that has a wide scope and good availability in the future which we have used to protect the privacy of people.

In this circuit we use some basic terminology and concept of electrical and electronics engineering and some simple equipment.

As experiments are never dies and ideas are never stops so there also a possibility of improvement in this system.

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