

MOBILE PHONE DETECTOR

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ABSTRACT - Cell phones are widely used in the world. While people need to be connected to at least one another, there are situations or places where their usage is to be prohibited either thanks to security reasons or it's going to cause health hazards. Cell phone detection has been on investigation for an extended time. There are techniques which are formulated or proposed on how cell phones are often detected. Most of them use the features like sound system, RF system and customary materials of the phones and check out to seem into how they will be used as basis to detect mobile phones. This project utilizes the RF system of the telephone because the feature to be used to detect its presence. A circuit that detects signals of the range 0.9GHz to 3GHz is employed to detect a telephone when in use. When the signal is detected, an LED blinks to point the usage of a telephone within a radius of 1.5metres.

Keywords : Cell phone, LED, RF system, CA3130IC

1.INTRODUCTION

Cell phones became 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 like remote health monitoring systems and security systems have been integrated with mobile phones. The recent years have seen rapid advancements within the value addition applications in mobile phones like high definition cameras and high speed internet connectivity. The country has also experienced developments within the infrastructures to support the rising need of faster internet connectivity.

Despite the benefits enjoyed by these advancements in mobile technology, there are threats that are posed by their usage. Company data processing has been an enormous threat within the industry where employees are ready to access sensitive company information and share with the competitors. This led to the event of telephone jammers where signal reception is totally blocked once you enter the premises. Despite personal privacy invaded by the usage of such devices, this might not put to an end the vice since mobile phones might be connected to the pc and information transferred and sent when the worker is out of the corporate premises. Criminal activities and attempted escape incidences are organized by inmates in correctional institutions through the utilization of mobile phones in such facilities.

Life support machines also are sensitive to the utilization of mobile phones. The use of mobile phones in such a facility results in adverse repercussions to the lifetime of persons whose lives depend upon the right functionality of the machines. Other places are Airplanes, petrol stations, conference halls, examination halls, worship centers, etc. where the utilization of mobile phones can either cause failure of sensitive machines or may be a nuisance.

2. SCOPE OF WORK

This handy telephone detector can sense the presence of an activated telephone from a distance of 1 and a half meters. It can detect the both incoming and outgoing message, calls, and video transmission even if the cell phone is kept in silent mode. The moment the bug detects RF transmission signal from an activated telephone, the LED starts blinking until signal transmission ceases. It is often used to detect active cell phones in hospitals, petrol pumps, court of law and military bases.

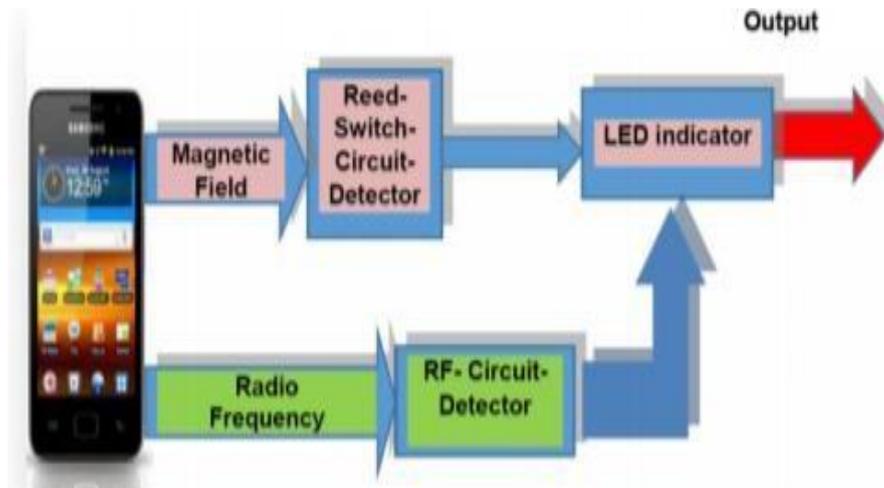


Figure 1 : Design approach of two detector

3. PROPOSED MODEL

The cell phone detectors are very useful for detecting people using cell phones to spy or for unauthorized video transmission. The cellphone detectors are also used in certain places like a temple, offices, exam hall, and theaters where the use of cell phones are not allowed to detect and restrict these people from using the device. They are capable of detecting video transmission, SMS and incoming and outgoing calls even if the cellphones are in the silent mode.

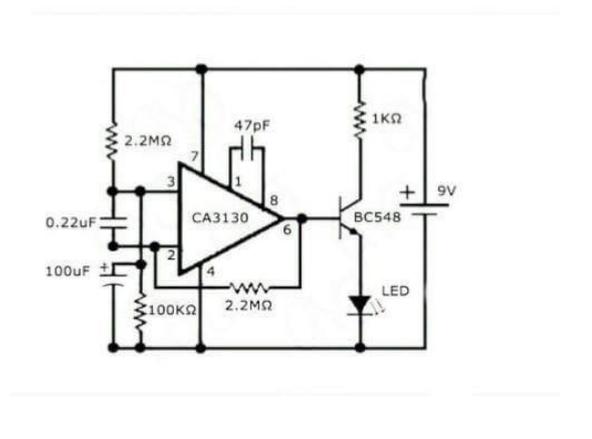


Figure 2 : Circuit diagram of a Mobile phone detector

Components Required for the project :

- BREADBOARD
- LED
- CA3130 IC
- 1 KΩ RESISTOR
- 100 KΩ RESISTOR
- 0.22μF CAPACITOR
- 100μF CAPACITOR

- BC548 TRANSISTOR
- 9 V BATTERY
- BATTERY CLIP
- 2.2 MΩ RESISTOR
- 47 pF CAPACITOR

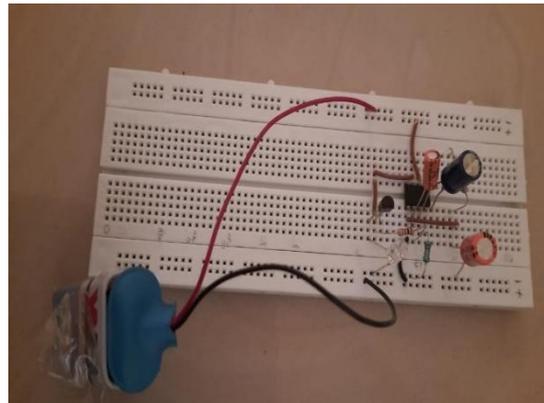


Figure 3 : Working Model Of a Mobile Phone detector

Working Principle:

Ordinary LC (Coil-Capacitor) circuits are used to detect low frequency radiation in AM and FM bands. It can detect maximum MHz frequency. From mobile we get frequency in terms of GHz. The transmission frequency of mobile phone ranges from 0.9 to 3GHz with wave length of 3.3 to 10 cm. So a circuit detecting GHz signals is required. Here 0.22μF disk capacitor is used to capture the RF signals from the mobile phone. This along with the leads acts as small GHz loop antenna to collect the RF signals. One lead of the capacitor gets dc from the positive rail and the other lead goes to the negative input of ic. The capacitor gets energy for storage .This energy is applied to the input of the ic. So the inputs of ic is nearly balanced and output is nearly zero. But at any time ic can provides a high output if a little current is induced to its inputs.

In short, capacitor carries energy and is in an electromagnetic field. So a small change in field caused by the rf signals from phone will disturb the sector and forces the capacitor to release energy. The led blinks until the signal ceases.

4. EXPERIMENTAL RESULTS

Upon making a call, the LED of the mobile-phone-detector circuit starts blinking. This continues until the transmission ceases. The detector is in a position to detect the presence of an active-phone within a distance of about 4meters, giving the warning-indication if someone uses mobile-phone within the radius. The simulated circuit of mobile-phone- detector is as shown in Figure2. while Figure 3 shows breadboard-assembly of the same. It was observed during the experiments, that the utilization of purely-analog-circuits made troubleshooting and debugging harder as compared to software- related-circuits.

Also, the presence of RF-signals from the various colleagues' phones all around made the detector circuit over-responsive

5. CONCLUSION

The results as obtained show that the mobile phone detector worked sufficiently. The detector could detect the signal within the frequency range of 0.9GHz to 3.0 GHz thus a mobile phone that's in use. This phone usage was indicated by the blinking of the LED. When a mobile phone is on standby mode, it keeps a radio silence therefore can't be detected using this telephone detector. It is often concluded that the project was successful. This detector can therefore be went to track the usage of a telephone in an examination room where a buzzer usage are going to be too loud and disturb the examiners. Through the device is handy, it has its own pros and cons just like other devices

PROS:

- The device is sensitive to even channelize other RF signals belonging to other devices other cellphones like radios.
- It can be used for detecting cell phones used for spying and transmission of unauthorized audios and videos.

CONS:

- It is a short range detector, of the order of centimeters.
- The presence of this device would jam the signals of others devices due to the fluctuations.

6. Future Scope

To improve the functionality of this telephone detector we will do the subsequent :

- Increase the range of the detector.
- Incorporate a buzzer to sound an alarm when a telephone in use is detected.
- To enhance the detector we will use a microcontroller.
- Make the LED explode until a telephone is in use.
- Improve the detector to be ready to detect even cell phones on standby mode

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