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Spy Camera and Mobile Phone Detector

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ABSTRACT - The main scope of project is to sense the presence of an activated mobile phone and camera from a distance of one-and-a-half meters to prevent the use of same in the examination halls. Certain places where uses of mobile phones are not allowed like exam hall, temple, offices and theaters, in those places to detect and restrict the use of mobile phones this proposed system is very helpful. This system can detect any active cell phone i.e. when someone is trying to make a call or receive a call, sending a message or receiving a message. In the above mentioned conditions a buzzer will sound, in the presence of an active cell phone in the radius of one and half meters. In our day to day life the usage of mobile phones

has been increased in restricted area such as exam venues, places of important meeting, offices, conference halls, prison etc. and the hidden wireless camera in trial rooms and hotels, public toilets. The radio frequency signals are transmitted from wireless camera and mobile phone during the video transmission, incoming call and outgoing call, text messages from one gadget to another. The detector will detect the transmitted signal and then it is gives as input to Arduino microcontroller. As soon as the Arduino microcontroller receives the signal, it will turn ON the beep alarm and the information will be notification on mobile .This system will be used to detect the mobile phones and the wireless hidden camera present in a room

by the radio frequency signals which are transmitted by them.

Index Terms— Arduino, RF Detection, Camera, Mobile, Nodemcu

INTRODUCTION

In recent years, there has been increasing issues relating to the use of mobile phones and camera in restricted areas. The mobile phone provides many ways for a student to cheat in an examination hall. The mobile phones are strictly prohibited inside the examination rooms. One of the existing approaches is to ensure the students are free of mobile phones in examination hall is by manual inspection in the entrance. Manual inspection cannot fully reveal the students having mobile phones all the time. These devices will ensures the connectivity between a student sitting inside the hall and outsiders have been considerably increased a burden to invigilators to ensure that malpractices are not committed during exams. A student may constantly communicate with other students outside the examination hall via Email and text messages. They can exchange information such as question and answer through whatsapp, Email attachments etc. By using a mobile camera a student can take the snap shot of the question paper and send to other students for help. Sometimes there are more

possibilities for leaking the question papers. Nowadays mobile has internet connectivity so that a student can post questions in online and gets quick response and in addition they can search for answers in search engines. The storage capacity in the mobile offers students to store lecture notes, books and other unauthorized materials that are related to the exam. Many applications installed in mobile phone allow a student to commit cheating, application such a scientific calculator, dictionary etc. as the technology keeps on advancing, the students also get access to those technologies to commit cheating. The hidden wireless cameras, eaves dropping microphones etc which are used in an illegal way in areas like trial rooms, hotels, and in places of important meetings. So there is need for the detection of signals which are emitted from the hidden wireless camera, microphones, mobile phone. Here we try to prohibit the unauthorized use of mobile phones by using a detector, that sense the presence of an activate mobile phone signals radiated by them and also the camera which radiates RF signal. Efforts have been put in place to tackle this issue but they all have their own shortcomings. The circuit can detect the signals during video or audio transmission from hidden camera

and microphones also incoming calls and outgoing calls, messages and video transmission from mobile phone. The detector detects the RF signal and the signal information is indicated by using a beep alarm and notification send through the mobile phone. The alarm continues until the RF signal transmission get off. The transmission frequency range of the mobile phone signal is about 0.9 to 3 GHz and the wavelength of about 3.3 to 10cm. so there is a need to design a circuit that detects GHz frequency signals. The rapid growth of cell phones in the 21st century to till now has raised many problems. In addition, public reaction was growing against the disturbance of cell phones introduced in daily life. We designed a simple engineering project, namely hidden active cell phone detector. The pocket sized cell phone detector can detect the hidden active cell phone. So this project is used to neglect the use of cell phones in exam halls, private rooms, defence establishments, hospitals, military camp, petrol pumps and also very useful for sensing the use of mobile phone for spying and other correlated activities. This circuit can detect calls, SMS, video transmission even when the cell phone is hidden in silent mode. The prompt bug detects radio frequency transmission signal (RF) from a

cell phone, it generates a beep sound alarm.

SYSTEM DESIGN

The system consists of RF signal detector, ATmega 328p microcontroller, nodemcu, and buzzer alarm. The basic principle of mobile detector is the idea of using disc capacitor to detect the cell phone signal with the frequency range 0.9 to 3GHz within 1.5 meter radius. The capacitor and the lead acts as a loop antenna, which is capable of receiving the transmitting signal from the activated mobile phone and the wireless camera which is transmitting the live video in a room. The signal is received by the RF detector by mutual induction between the capacitor and lead. The signal is given as an input to the ARDUINO Microcontroller, there the signal is rectified and then it is sent for further process. The signal received is an analog signal. The analog signal is converted into the digital signal using Analog to Digital converter, this A/D converter is induced in the microcontroller. It is programmed by using Arduino software. The RF detector detects the RF signal and sends to microcontroller to transmission signal into digital signal. And the microcontroller sends the information to nodemcu and notification on mobile. Here the circuit uses disc capacitor 0.22 μ F, in order to

capture the RF signal transmitted from wireless hidden camera and mobile phones. The lead is fixed in order to get desired frequency. The disc capacitor along with the lead acts as a loop antenna to capture the RF signal from RF bugs hidden in a room. Op-amp IC CA3130 is used for current to voltage conversion with capacitor C3 which is connect in between inverting and non inverting inputs of the op-amp.



Fig:NODE MCU

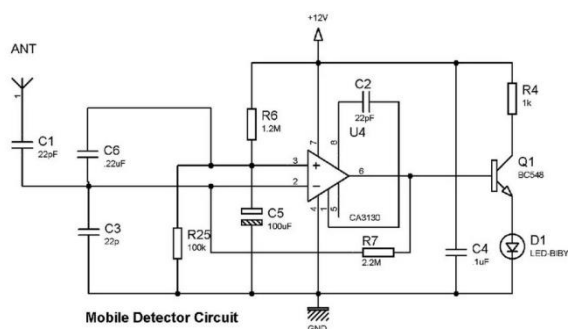


Fig:Arduinio board

The P channel MOSFET transistors present in the input to provide very high input impedance, very low current and high speed performance IC-555 timer is a highly stable controller which is capable of producing accurate timing pulses. And the monostable operation the time delay is controlled by the external resistor and one capacitor. With an a stable operation the frequency and duty cycle are controlled by two external resistors and one capacitor. Capacitor C3 creates a field and stores energy. Then transfer the stored energy into current which is input to the IC1 and convert into voltage. Capacitor C4 with the resistor R1, keeps the non-inverting input stable for high state output. Capacitor C4 discharges and the feedback resistor R3 will make the inverting input high for high output. Capacitor C5 (45pF) strobe and null of IC1 for the phase compensation and the gain control to get better frequency response. When the capacitor C3 detects the RF signal, the output of the IC1 becomes low and high alternately. The frequency of the signal is indicated by LED1. This signal will trigger the IC555 timer through capacitor C7. Capacitor C6 maintains bias voltage of the transistor T1 for fast switching action. The components R6 and C9 produce very short time delay. The microcontroller gets the input RF

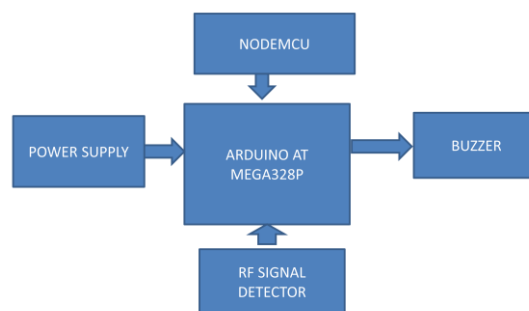
signal and performs the operation programmed in it. It sends the information to nodemcu and it is displayed as “DEVICE DETECTED” and alarm sounds until it stops receiving the RF signal.

CIRCUIT DIAGRAM



The transmission frequency of cell phones ranges from 0.9Hz -3GHz with a 3.3cm - 10cm wavelength. RF signals can be collected from the cell phone along with the disk capacitor and the leads which acts as a small gigahertz loop antenna. When the cell phone is triggered, it transfers the signal in sine wave form which permits through the space. The circuit diagram of the hidden active cell phone detector is built with operational amplifier, monostable multivibrator and piezo buzzer.

BLOCK DIAGRAM:

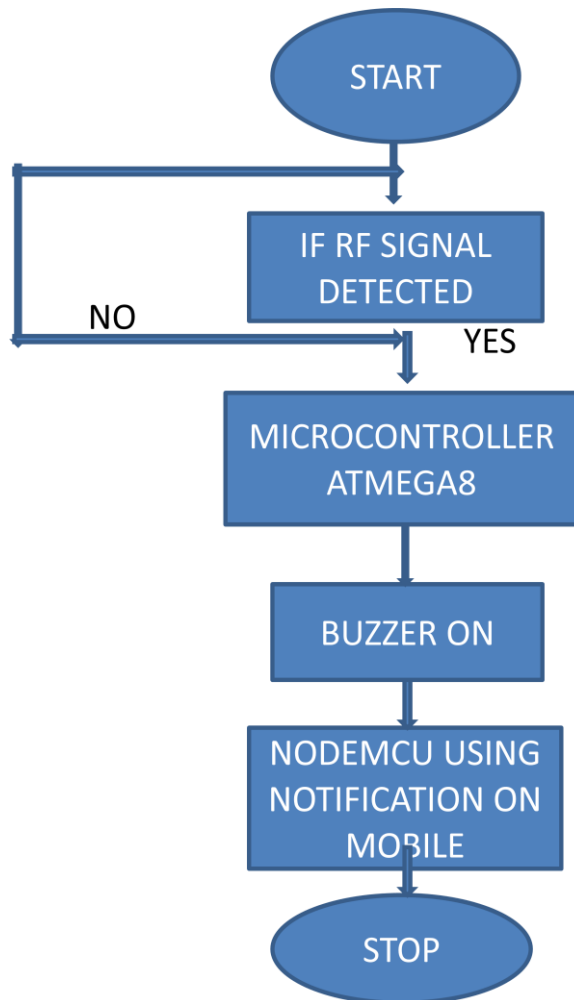


METHODOLOGY:

ALGORITHM:

- STEP 1: Start.
- STEP 2: If RF signal detected then go to step4.
- STEP 3: If no RF signal detected go to step1.
- STEP 4: Buzzer ON.
- STEP 5: Notification send to mobile.
- STEP 6: Stop.

FLOW CHART:



CONCLUSION: Hidden camera detection would detect spy cameras in trial rooms, theatres and many other public places where it is prohibited with immediate report to the authorities after the detection. Manually checking their presence is almost impossible, the proposed system is an efficient method for camera detection because no matter how small the lenses are, they can be easily detected. In confidential meeting rooms, even after heavy checking people manage to skip the security and take cameras inside, record the conversations and use them for illegal purposes. So this

application would be of great help for camera restricted areas.

FUTURE SCOPE: Trying to increase the detecting range by using the preamplifier stage using JFET or MOSFET transistor used in an interface between the capacitor and IC. Being able to detect the Bluetooth transfer. Current system only detects the 2G/3G transmission signals and can improve the detecting range for upcoming 4G and 5G transmission signals. To determine the exact position of mobile phone and camera hidden in a room by using GPS module.

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