PRIYADARSHNI J.L. COLLEGE OF ENGINEERING, NAGPUR

DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

"Cell Phone Detector"

A REPORT

Submitted in partial fulfillment of the practical requirements for the Mini project of

Bachelor of Engineering

(V Semester)in

ELECTRONICS & COMMUNICATION ENGINEERING

to

RASHTRASANT TUKADOJI MAHARAJ NAGPUR UNIVERSITY, NAGPUR.

Faculty of Engineering & Technology

Submitted By

1.Vedant pathrabe **2.Dhanashree patil**

Under the Guidance of

Prof.Yeshwant Deodhe

(Guide)

SESSION (2024-25)

PRIYADARSHINI J.L COLLEGE OF ENGINEERING

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Certificate

This is to certify that the project report entitled

"Cell Phone Detector"

Being Submitted By…..

1. Vedant pathrabe **2. Dhanashree patil**

For partial fulfillment of the Mini project requirements for the Bachelor of Engineering (V Sem.), Electronics & Communication is the record of their own work carried out by them under my guidance and supervision for session 2024-25.

Project Guide
Prof.Y.A.Deodhe

HOD,ETC Dept
Dr.P.B.Pokle

DECLARATION

This project report entitled “Title of Mini Project” is our own work carried out under the guidance of Prof.Y.A.Deodhe at Priyadarshini J.L College of Engineering, Nagpur. This work in the same form or any other form is not submitted by me or by anyone else for award of any degree.

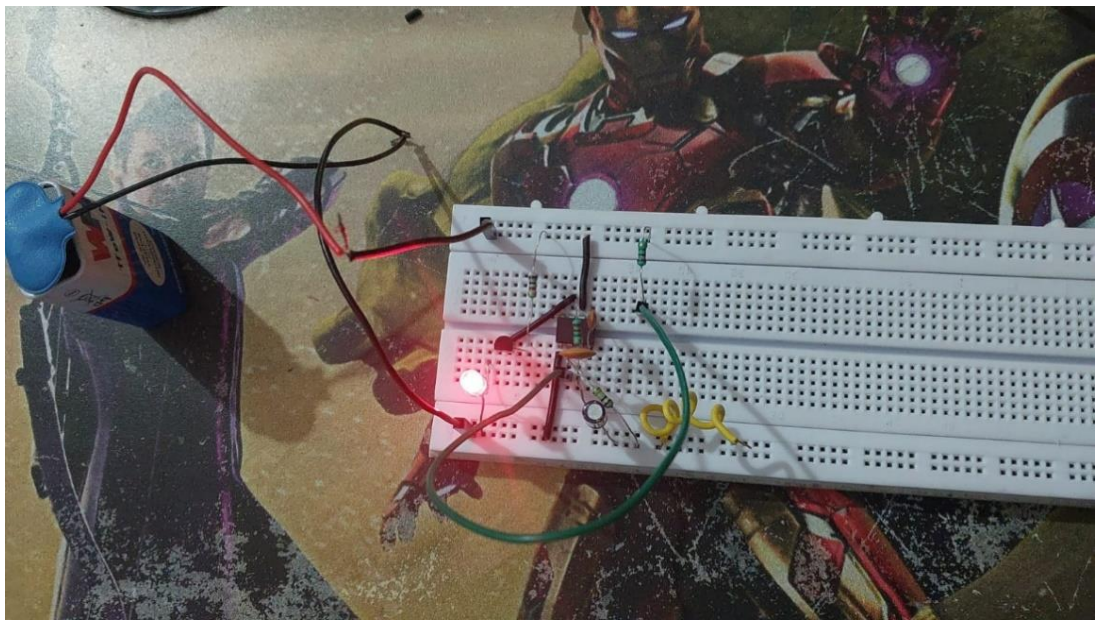
1.Vedant Pathrabe

2. Dhanashree Patil

Introduction of Mini project:-

The most common electronic equipment used now-a-days is Cell Phone or Mobile Phone. With advancement in communication technology, the requirement of cell phones has increased dramatically. A cell phone typically transmits and receives signals in the frequency range of 0.9 to 3GHz. This article provides a simple circuit to detect the presence of an activated cell phone by detecting these signals.

I have designed a circuits that act as Cell Phone Detector Circuit using a combination of Schottky Diode and a Voltage Comparator .



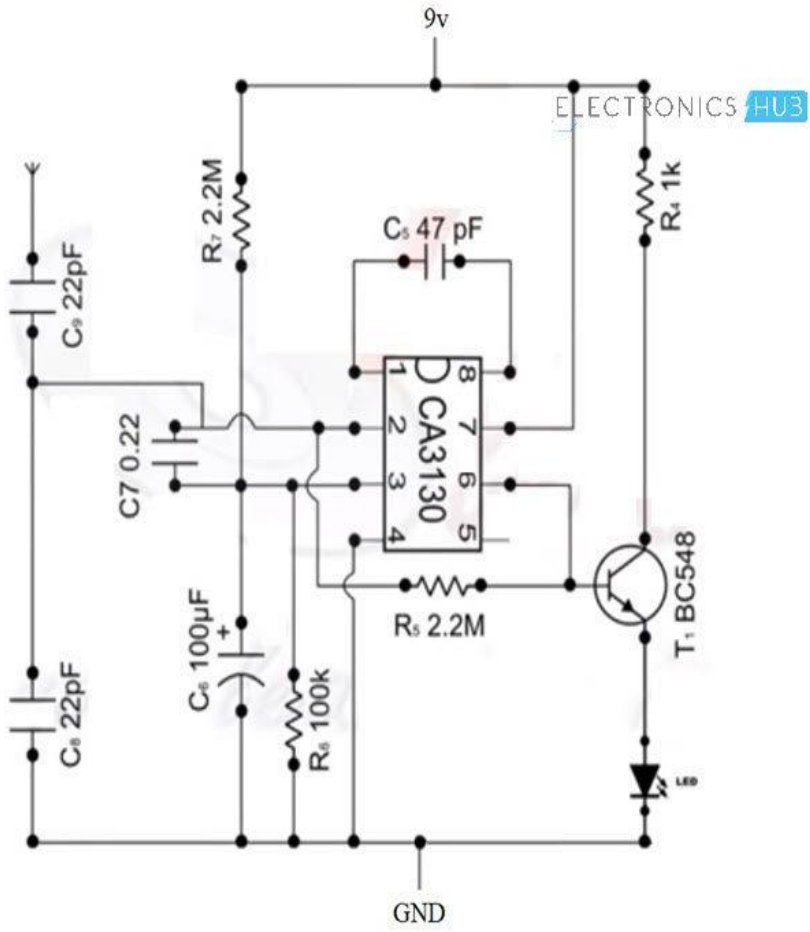
Basic Principle of Mobile Phone Detector Circuit :

The basic principle behind the Cell Phone Detector circuits is to detect the RF Signals. In the Schottky diode circuit, the Schottky Diode is used to detect the cell phone signal as they have a unique property of being able to rectify low frequency signals, with low noise rate.

When an inductor is placed near the RF signal source, it receives the signal through mutual induction. This signal is rectified by the Schottky diode. This low power signal can be amplified and used to power any indicator like an LED in this case.

Circuit Diagram and Components:-

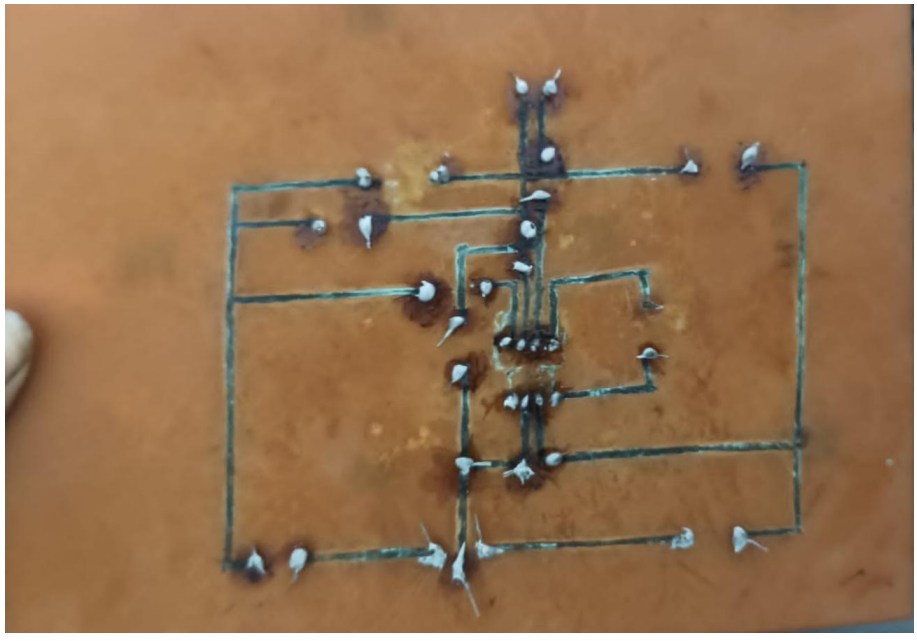
Simple Cell Phone Detector Circuit :
The first circuit of the cell phone detector is a simple implementation using an op-amp and a few other passive components.



Components Required :

- CA3130 Op-Amp
- Resistors – 2.2MΩ x 2, 100KΩ, 1KΩ
- Capacitors – 22pF x 2, 0.22nF, 47pF, 100µF
- BC548 NPN Transistor
- LED
- Antenna
- Connecting Wires
- Breadboard
- 9V Battery

PCB Layout:-



Working:-

Cell Phone Detector Circuit Working :
The Op-amp part of the circuit acts as the RF Signal Detector while Transistor part of the circuit act as the indicator.

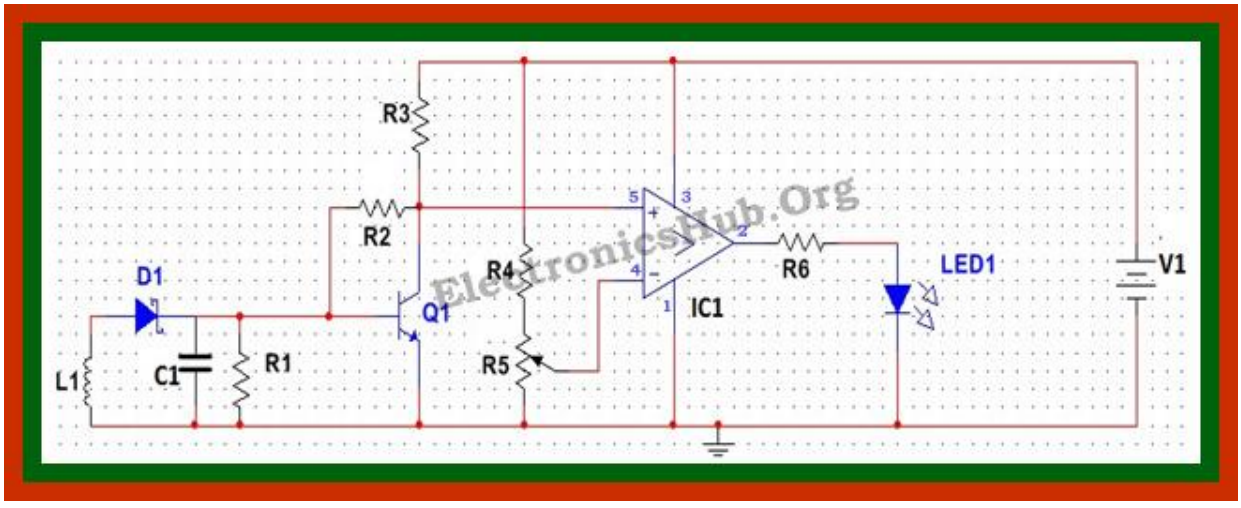
The capacitors collection along with the antenna are used to detect RF Signals when a cell phone makes (or receives) a phone call or sends (or receives) a text message.

Op-Amp reads the signals by converting the rise in current at input to voltage at output and the LED will be activated.

Mobile Phone Tracking Circuit Operation :
In normal condition, when there is no RF signal, the voltage across the diode will be negligible. Even though this voltage is amplified by the transistor amplifier, yet the output voltage is less than the reference voltage, which is applied to the inverting terminal of the comparator.

Since the voltage at non inverting terminal of the OPAMP is less than the voltage at the inverting terminal, the output of the OPAMP is low logic signal.Now when a mobile phone is present near the signal, a voltage is induced in the choke and the signal is demodulated by the diode. This input voltage is amplified by the common emitter transistor.

The output voltage is such that it is more than the reference output voltage. The output of the OPAMP is thus a logic high signal and the LED starts glowing, to indicate the presence of a mobile phone. The circuit has to be placed centimeters away from the object to be detected



Applications:-

A cell phone detector is a device that detects the presence of mobile phones by identifying their radio frequency (RF) signals.

Here are some common applications of cell phone detectors:

1. Examination Halls and Educational Institutions

- To prevent students from cheating by using mobile phones during exams.
- Detect unauthorized use of phones in classrooms to maintain focus.

2. Secure Areas and Government Facilities

- In high-security zones like military bases, government offices, and research labs where phone usage is restricted for security reasons.
- Prevent data breaches and information leaks by detecting unauthorized devices.

3. Hospitals and Medical Facilities

- In areas where mobile phones may interfere with sensitive medical equipment, such as operating rooms or intensive care units (ICUs).
- Ensures compliance with regulations banning mobile devices in specific wards.

4. Prisons and Correctional Facilities

- To prevent inmates from using contraband phones to make unauthorized calls or coordinate illegal activities.
- Helps maintain security and prevent criminal activities from inside the prison.

5. Corporate Offices

- In boardrooms or other sensitive areas during confidential meetings to prevent the use of mobile devices that could lead to information leaks.
- Ensure compliance with no-phone policies in certain workspaces.

6. Theaters and Cinemas

- To detect and discourage the use of phones during performances or screenings, maintaining the audience's experience.
- Prevent illegal recording of movies or performances.

7. Law Enforcement

- Used by police during raids or investigations to locate hidden mobile devices.
- Assist in surveillance and tracking of suspects using mobile communications.

8. Places of Worship

- To ensure a distraction-free environment by detecting and discouraging phone usage during prayers or sermons.

9. Exhibitions and Museums

- To enforce rules banning mobile photography in areas where sensitive artifacts or artwork are on display.
- Helps protect the integrity of exhibits where mobile phones are not allowed.

Cell phone detectors help maintain discipline, security, and privacy in various sensitive environments.

Conclusion:-

Cell phone detectors play a crucial role in maintaining security, privacy, and order in environments where the unauthorized use of mobile phones can lead to disruptions or security breaches. They have proven to be effective tools in areas such as educational institutions, government facilities, prisons, and hospitals. These detectors help enforce no-phone policies, protect sensitive information, and prevent illegal activities.

Future Scope:-

The future of cell phone detectors is promising, with potential advancements in technology making them more efficient and versatile. Some possible future developments include:

- Trying to increase the detecting range of cell phone detector to few more meters for observing wide range of area.
- Improved Sensitivity and Range: Future cell phone detectors could have enhanced sensitivity, allowing them to detect mobile devices from longer distances and through more complex environments, such as buildings with thick walls or multiple floors.
- Integration with AI: Artificial intelligence could be integrated into cell phone detectors to better identify patterns of mobile device usage, filter out false alarms, and detect phones even when they are in airplane mode or using advanced encryption methods.
- Miniaturization and Portability: As technology continues to shrink, future detectors could become smaller, more portable, and easier to deploy in various environments, from large public spaces to personal use in homes or small offices.
- Multi-Device Detection: In addition to detecting mobile phones, future devices may be able to detect other unauthorized electronic devices such as smartwatches, tablets, and even smart glasses, offering more comprehensive security solutions.
- Integration with Security Systems: Future detectors could be integrated with broader security systems, such as CCTV, alarm systems, or access control systems, allowing for real-time responses to unauthorized phone use.
- Smartphone Detection: Advanced detectors might be able to differentiate between personal smartphones and professional devices based on signal characteristics, allowing for more tailored detection in professional settings.
- Cell phone detection technology is set to evolve and expand, providing more sophisticated solutions for secure and controlled environments.