CELL PHONE DETECTOR

OBJECTIVE:

Cell Phone Detector detect the activation of a mobile phone such as;
incoming and ongoing phone calls, messages, and things in that nature..

ABSTRACT:

Mobile phone detectors are devices that that can detect active mobile phones around them by using antenna based detection system. As stated earlier when mobile phones are active there exist a radio frequency signal transmitted and received by the trans receiver and the mobile, thus mobile phone detectors detect are designed to detect this kind of signal by their antenna and use it as an input then give us an output weather by a speaker alarm, buzzer our any output device

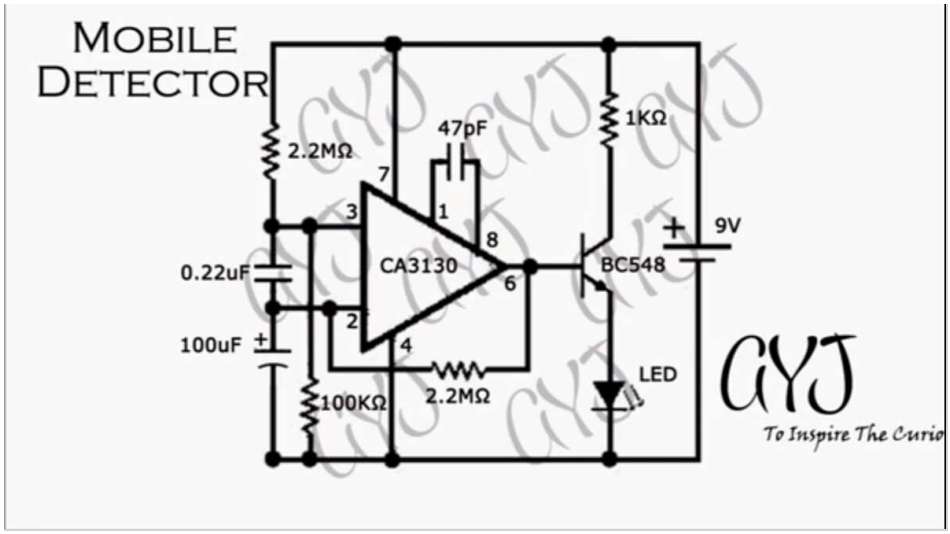
INTRODUCTION:

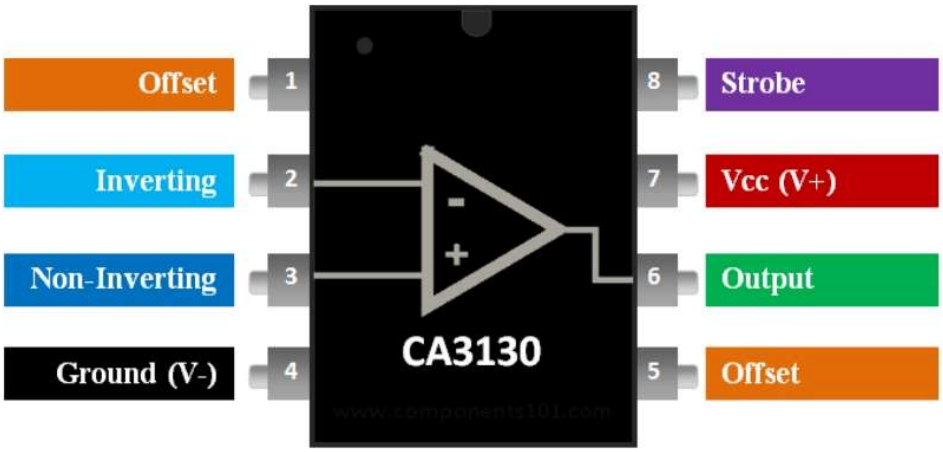
The cell phone detector is a technological device that detects the presence and existence of cell phones in an area or within a stipulated range of operation. Once this cell phone detector detects the presence of a cell phone, the phone detector system raises the alarm and speak to the mobile phone user to switch it off. The cell phone detector has different ways of alerting the user of the phone; it does this by either sending an alert message, a single beep of the detector or ringtone. The operator of this device can record a voice message or write a customized text message that will be sent to every phone detected. This is a great way to prevent the use of cell phones in examination halls, worship sites, private rooms, etc. The use of the cell phone detector is also one of the ways of managing cell phones in the classroom.

HARDWARE REQUIREMENT/DESCRIPTION:

COMPONENTS	RATINGS	QUANTITY
IC	CA3130	1
Transistor	BC548	1
Resistor	2.2 MΩ	2
Resistor	100kΩ	1
Resistor	1kΩ	1
Capacitor	100uf/50V	1
Capacitor	0.22uf	1
Capacitor	47pf	1
LED	3V	1
Battery	9V	1
Breadboard	-	1

CIRCUIT DIAGRAM:





DESIGN ISSUES:

- Maximum supply voltage should not exceed 15V

METHODOLOGY:

A) PARTS

i. CA3130 IC
ii. 1kΩ resistor
iii. 100kΩ resistor
iv. Two 2.2MΩ resistors
v. 47pF capacitor
vi. 0.22F capacitor
vii. 100F capacitor
viii. BC548 Transistor
ix. Light-emitting Diodes
x. Power Supply 9V
xi. Wires
xii. Breadboard
xiii. Digital Multimeter

B) The Purpose of Each Part

i. The CA3130 IC is an op-amplifier that combines the advantages of bipolar and CMOS.
ii. Each resistor is used to control the current throughout the circuit
iii. Each capacitor is used to store energy and provide the circuit with energy when it is necessary.
iv. Transistors are used to switch electronic signals and electrical power.
v. Light-emitting diode is used to provide light for the final output. **vi.** Power Supply is used to provide the circuit with a proper amount of voltage.
vii. The digital multimeter is used to set the power supply to the required voltage amount.
viii. Wires are used to connect each component within the circuit together.
ix. Breadboard is needed to construct the circuit.
x. Anode is the positive end of the capacitor and transistor
xi. Cathode is the negative end of the capacitor and transistor.
xii. The base of the transistor is the second terminal of the transistor.
xiii. Anode, as well as, the collector is the first terminal of the transistor.
xiv. Cathode, as well as, the emitter is the third terminal of the transistor

c. Procedure

i. Connect the digital multimeter and power supply together.
ii. Set the power supply to 9 volts.
iii. Place a wire into the breadboard for voltage, as well as, a wire for the ground.
iv. Place CA3130 IC onto the breadboard.
v. Connect pin 7 of the CA3130 IC to the voltage source.
vi. Connect pin 4 of the CA3130 IC to the ground.
vii. Place the BC548 transistor into the breadboard.
viii. Connect Pin 6 of the CA3130 IC to the base of the BC548 transistor.
ix. Connect the collector of the BC548 transistor to the voltage source using the 1kΩ resistor.
x. Connect the anode of the light-emitting diode to the emitter of the BC548 transistor and the cathode of the light-emitting diode is connected to the ground.
xi. Connect pin 2 of the CA3130 IC to the base of the BC548 transistor using a 2.2MΩ resistor.
xii. Connect pin 3 of the CA3130 IC to the ground using a 100kΩ resistor.
xiii. Place the 100F capacitor to the breadboard.

xiv. Connect the anode of the 100F capacitor to pin 3 of the CA3130 IC, as well as, the cathode of the 100F capacitor to the ground.

xv. Connect pin 3 of the CA3130 IC to the voltage using a 2.2MΩ resistor.

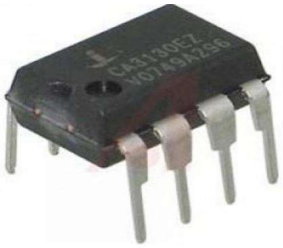
xvi. Connect pin 2 to pin 3 of the CA3130 IC using a 0.22F capacitor.

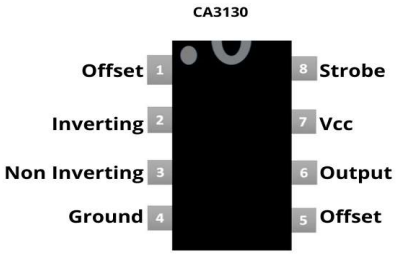
xvii. Connect pin 1 to pin 8 of the CA3130 IC using a 47pF capacitor.

COMPONENTS –

IC CA3130:

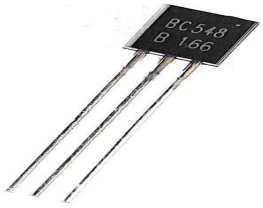
Used in mobile jammers, oscillator circuits, DAC circuits, voltage follower, noise detectors, peak signal, distorter, or frequency generator.
These ICs are used to build engineering projects.





Transistor BC548:

Used in Darlington pairs to amplify weak signals.
It can be employed in sensor circuits.
Driving loads under 500mA.
Used in audio amplification.
Used in audio Amplifier Stages

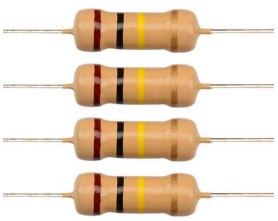


Resistor 2.2 MΩ:

2.2k ohm Carbon Film Resistors are typical axial-lead resistors, which have much better temperature stability and provide lower noise, and are generally better for high frequency or radiofrequency applications

Resistor 100kΩ:

100k ohm Carbon Film Resistors are typical axial-lead resistors, which have much better temperature stability and provide lower noise, and are generally better for high frequency or radiofrequency applications.

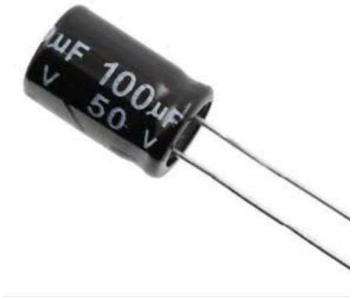


Resistor 1kΩ:

Commonly used in breadboards and other prototyping applications, these 1K ohm resistors make excellent pull-ups, pull-downs and current limiters. These thick-lead versions of the resistors fit snugly into a breadboard with very little movement

Capacitor 100uf/50V:

Electrolytic decoupling capacitors 100uF/25V. These capacitors are great transient/surge suppressors. Attach one between the power and ground of your project to ensure smooth power delivery.



Capacitor 0.22uf:

This is a 0.22uF Ceramic Capacitor Use this capacitor for power decoupling, having a smooth power in your circuit, timing circuits etc

Capacitor 47pf:

47pF 50V Ceramic Disc Capacitor for LEDs, arduino projects, adafruit projects, pcbs, circuits etc... Used for RC, Cars, Trucks, RVs, Boats, Planes, PC, flashing circuits, smoothing, circuits, and much more!

Battery 9V:

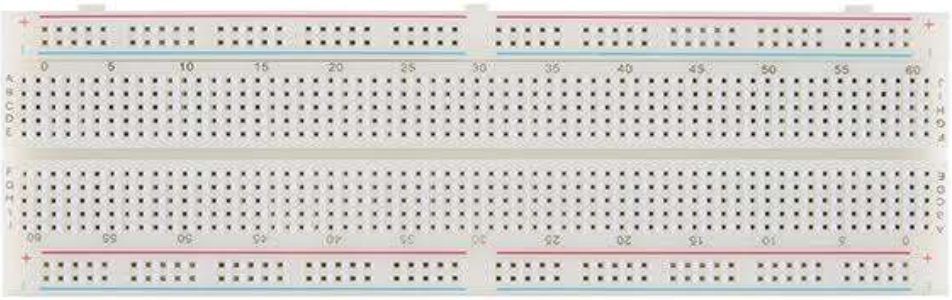
It is based on Zinc Carbon Chemistry and can be used easily replaced if discharged just like any standard AA and AAA batteries. The battery can be used to power LEDs, Toys, Flashlight and Torch, electronic equipment like multimeter, wall clocks, or other devices with a 9V system.

LED 3V:

Can be used to light up the led strip, floor and reading. Led light source, high brightness. High quality led chip, high brightness, energy saving and environmental protection. These led light can be used for reverse power supply of the same color flashing signal, but also have the ability to adjust voltage

Breadboard:

Breadboard (sometimes called a plugblock) is used for building temporary circuits. It is useful to designers because it allows components to be removed and replaced easily. It is useful to the person who wants to build a circuit to demonstrate its action, then to reuse the components in another circuit.



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 glow

CONCLUSIONS:

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.

REFERENCES :

https://youtu.be/PqVkrtvE6gI