

VISVESVARAYA TECHNOLOGICAL UNIVERSITY



MINI PROJECT REPORT ON “MOBILE SIGNAL JAMMER”

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CERTIFICATE

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The mini project report has been approved as it satisfies the academic requirements in respect of mini project work prescribed for the said degree.

Project Guide

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Signature with Date

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2.

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ABSTRACT

Mobile Signal Jammer circuit helps in preventing the mobile phones from either reception of signals or transmission of signals .

This circuit disables cell phones in and around certain restricted zones .Such a circuit can be placed in many locations but can be widely used in areas where mobile calls are interruptive, for an example in schools ,worship places ,hospitals etc.

There is definitely a frequency range in which the phones work ,and what this mobile signal jammer circuit does is that it sends radio frequency waves that are matching to the frequency range of the cell phones with this the circuit blocks the signal received or transmitted by the cell phones .

Variation in signal strength and 'No Network ' will be indicated by the cell phones when the mobile jammers are activated and also the calls will be blocked.

Global System for Mobile communication has a frequency range around 900MHz. The Code Division Multiple Access has frequency range of 800MHz. Distributed Control System has range between 1800MHz to 1900MHz.

Keywords: Reception of signals ,Transmission of signals , restricted zones, Signal strength

CHAPTER 01

INTRODUCTION

A Mobile phone works on the basic principle that it communicates to its main station or tower through a network in service. Cell phone towers are put up throughout the city and as a user moves from place to place the signal is passed from one cell tower to next.

A device that jams the signal, works on the same radio frequency range of that of the mobile phones which interrupts the communication that takes place between the base station and cell towers and the mobiles don't work in the range of a jammer.

The working of mobile phones are pretty simple, they have all their components compact including the antenna for portability and they comparatively use very less power. Therefore, the cell phones send a short range signal similar to that of a walkie-talkie.

Our mobiles send messages through radio frequencies that are being picked up by the cell towers at different stations. Then the wires or optical fibers carry the messages which routed to mostly underground, later it comes to your phones through the antenna.

Frequency range basically consist of two halves namely 'up line' and 'downlink'.

'Up line' is to send data from cell phones to stations while the 'downlink' is to send from the station to the cell phones.

There are three frequencies in which a cell phone can work:

1)Dual Band that works on two frequency - bands that is 900MHz and 1800MHz.

2) Tri Band that works on three frequency - bands that is 900MHZ , 1800MHz and 1900MHz.

3)Quad Band that works on four frequency - bands that is 1.850MHz , 900MHz , 1800MHz and 1900MHz .

CHAPTER 02

LITERATURE SURVEY

Jamming attack is a physical layer attack therefore it is very important to study the physical layer of wireless communication in order to protect the WSN from jamming attack, the most common wireless technologies use electromagnetic wireless telecommunications. Electromagnetic spectrum is the broad range of frequencies. Radio is only one slice of the electromagnetic spectrum, as shown in figure.

Radio waves can travel through solid materials such as clothing, furniture and brick walls because radio energy requires no medium. Radio waves affect conductors like metal and form different types of energy electrical signals, which means that radio waves cannot travel through metal walls but this also means that metal can be used in radio antennas on wireless modules (Faludi, 2011).

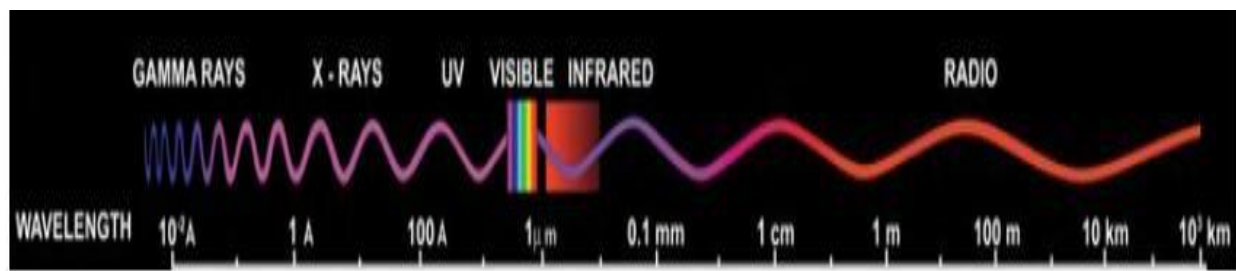


Fig:2.1

When radio signals radiate away from their source, they rapidly spread out like a wave in water. Radio decay occurs according to the inverse square law; therefore, it needs more power in order

to move to longer distances (Faludi, 2011). As such, it is important to keep the inverse square law in mind when designing WSN networks (Faludi, 2011).

$$I = P/4\pi r^2$$

I = Intensity at r

$$\pi = 3.14159$$

r = radius of sphere

P = power at source

$$\text{Surface area of sphere} = 4\pi r^2$$

Wireless communication has become very popular in recent decades because of its flexibility, low-cost management and implementation, in comparison to wired communications.

CHAPTER 02

LITERATURE SURVEY

A variety of jamming attacks can be performed to interfere with the wireless communication channel. The types of jamming attacks:

Constant Jammer

A constant jammer device continuously emits a radio signal without following MAC layer rules, which prevents a legitimate device from being able to use the channel to transfer traffic. A K mote-S1 Mote platform or a waveform generator can be used for testing (Zhang and Kitsos, 2009).

Deceptive Jammer

A deceptive jammer injects regular packets into a channel without gaps between packets so the legitimate sender will believe that the channel is busy. The jammer could send preamble bits continuously instead of entire packets (Zhang and Kitsos, 2009).

Figure shows that constant jammer continually emits radio signal, and can be implemented using either a waveform generator that continuously sends a radio signal or a normal wireless device that continuously sends out random bits to the channel without following any MAC-layer etiquette, aims at keeping the channel busy to cause interference to genuine nodes that have already started data transfer and corrupt their packets. Deceptive jammer instead of sending out random bits, the deceptive jammer constantly injects regular packets in terms of packet format such as preamble, payload and CRC without leaving any gap between packets to keep the channel busy.

Random Jammer

A random jammer changes continuously between sleeping and jamming modes. During the jamming mode it could act as a constant or a deceptive jammer. This type of jamming is used when the jammer needs to save power (Zhang and Kitsos, 2009).

Reactive Jammer

A reactive jammer starts transmitting a radio signal as soon as it detects activity on the channel. The jammer will not save power because it is continuously sensing the channel, but it is harder to detect (Zhang and Kitsos, 2009).

CHAPTER 03

PROPOSED METHODOLOGY

Cell towers are the ones that send the all the signals to the mobile phones and helps in the basic function of the cell phone .when the cell phone user moves about the base of the signals keep changing.

The mobile signal jammer circuits use the same radio frequency range of that of the mobiles. At the conditions when there are more than one source of signals the signal undergoes hampering and results in the prevention of the use of cell phones at certain zones in the range of the jamming circuit .this kind of jamming is called as the 'denial of service attack'.

Another way is a method in which many detectors are places in different parts of the buildings ,how this works is again very simple ,the detectors placed at different parts of the building detects and in turn sets the alarms which helps in alerting that someone has used the cell phones .This comes of help in places like the prisons where usage of cell phones are not allowed and this also helps in military purposes. Hence this circuit is of great significance.

Hence the above mentioned are some of the mobile signal jammer circuits's methodologies.

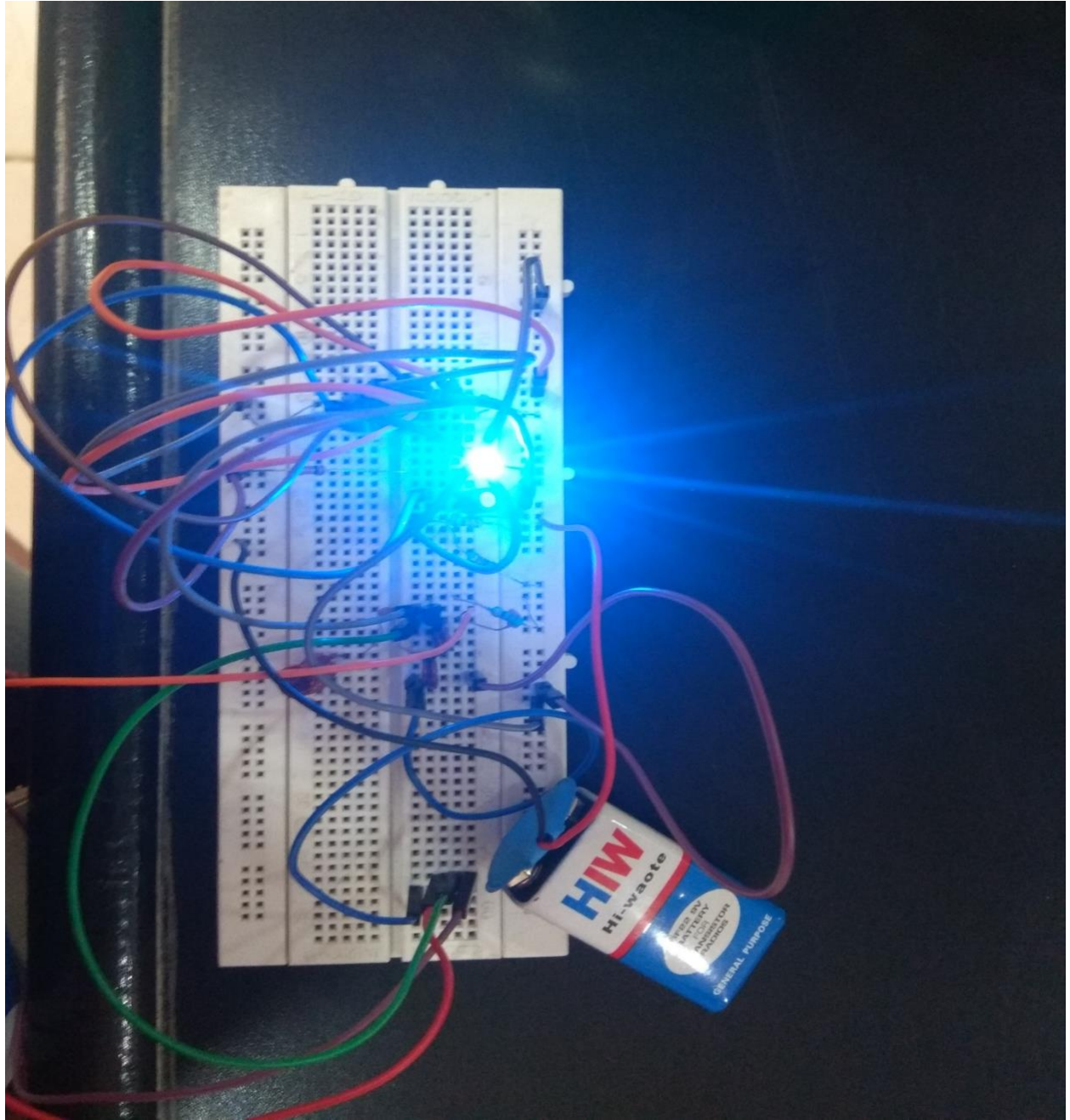


Fig 3.1 Top view of project

CHAPTER 04

PROJECT DESCRIPTION

A mobile signal jammer is a circuit that sums up to act as an instrument that helps in the prevention of mobiles from getting signals. We can say that a mobile signal jammer circuit is successful only if the phones get disabled when the jammer is in the particular range.

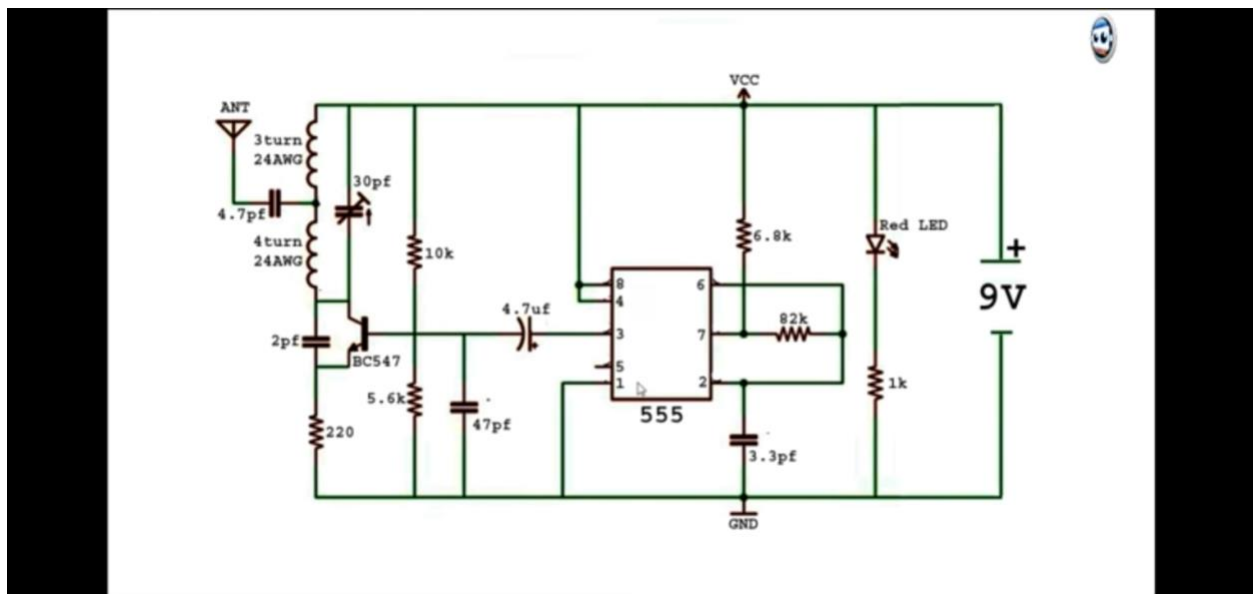


Fig:4.1

Hardware Components

- 1) **Power supply :**
A power supply consists of:

- Rectifier
- Filter
- Regulator

Rectifier: Conversion of AC voltage into steady voltage

Filter: To remove the alternating component of rectified output

Regulator: To obtain constant output voltage irrespective of load variations

Amplifier, oscillator and other such electronic circuit require a source of DC power.

Batteries are sources of DC power.



Fig:4.2

RESISTOR

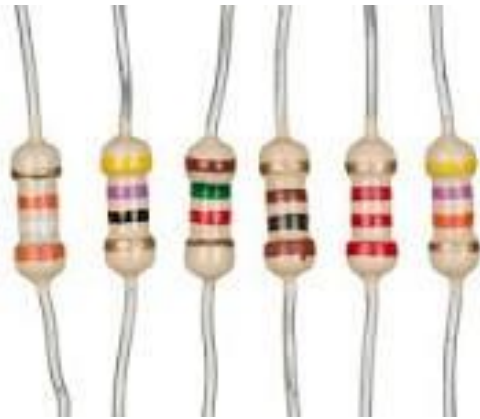


Figure 4.3

Resistors are electronic parts which have a particular, failing to change electrical opposition. The resistor's opposition restricts the progression of electrons through a circuit.

They are aloof segments, which means they just consume power (and can't create it). Resistors are generally added to circuits where they supplement dynamic segments like operation amps, microcontrollers, and other incorporated circuits. Ordinarily resistors are utilized to constrain current, partition voltages, and draw up I/O lines.

The resistors used in our signal jammer circuit are

10k

5.6k

6.8k

1k

220

82k

LED

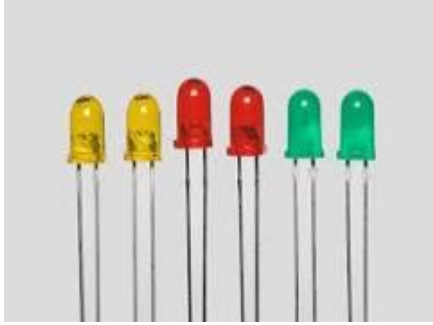


Figure 4.4

Fundamentally, LEDs are simply modest lights that fit effectively into an electrical circuit. Be that as it may, in contrast to conventional radiant bulbs, they don't have a fiber that will wear out, and they don't get particularly hot. They are lit up exclusively by the development of electrons in a semiconductor material, and they keep going similarly up to a standard transistor. The life expectancy of a LED outperforms the short existence of a glowing bulb by a huge number of hours

The LED used in our signal jammer circuit is a blue LED of wavelength 460nm

BREAD BOARD



Figure 4.5 – Bread board

A breadboard is a rectangular board with many mounting gaps. They are utilized for making electrical associations between electronic parts. The associations aren't perpetual and they can be evacuated and set once more. Indeed, you can even supplant segments to redo your venture or work on a totally extraordinary one, utilizing a similar breadboard.

The vertical segments of the breadboard are called terminals, while the flat long columns are called power rails since they are for the most part used to associate the power supply to the breadboard. The positive rails are shown by red lines, while the negative rails are demonstrated by dark ones.

IC 555 timer is used to generate accurate time delay.

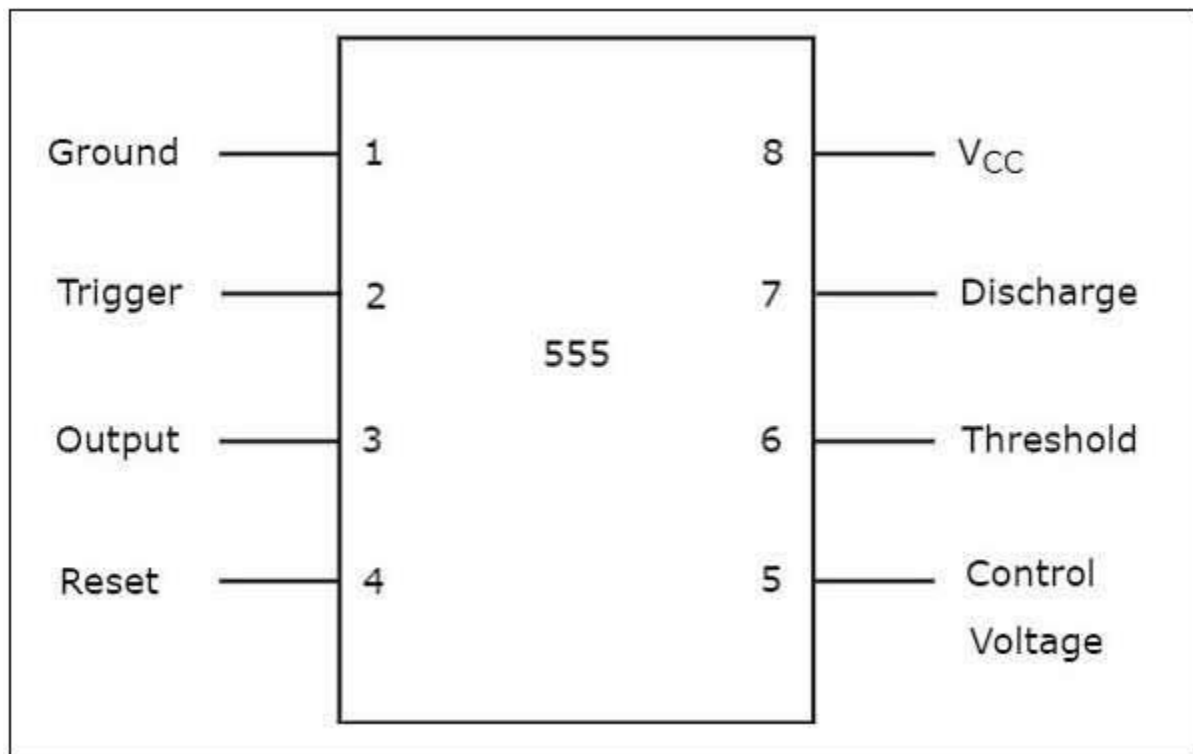


Fig 4.6



Fig 4.7

PIN 1: ground

This terminal is used to measure voltage with respect to it.

PIN 2: Trigger

There are two comparators in IC 555. there are three equal resistances in voltage divider. in this set up the non-terminal of the second comparator is kept steady with vcc. the second comparators inverted input is the trigger input and is taken out from the pin 2. the second comparators output is taken out at high.

PIN 3: output

You can connect load in two ways

1. Connected between 3 and ground
2. Connected between 3 and 8

PIN 4: Reset

It acts like the ON OFF switch. If it is connected to ground the device stops working .

PIN 5: control voltage input

It holds the voltage input of $\frac{2}{3}$ rd of vcc

This pin is the inverting terminal of comparator one

PIN 6: threshold

The external voltage is applied to pin 6

If the voltage is more than $\frac{2}{3}$ rd of vcc the comparator gives the output

PIN 7 Discharge

The collector of the discharge transistor is connected to the discharge pin .

It behaves like an open circuit

The capacitor charges the output low

the capacitor connected externally acts as short circuit

PIN 8: Supply

A supply voltage between 4.0v to 16 v is used for the IC 555 timer

TUNING CIRCUIT

This circuit consist of a capacitor and coil. Where the capacitor is made up of resistance adjustment circuit parallely connected with a capacitor and coil.

It is also called as a resonance circuit, tank circuit.

It's used for generating signals at a particular frequency.

It's an ideal model since there is almost no energy loss because there is no resistor.

It's mainly used as an oscillator.

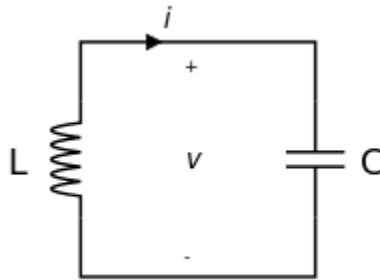


Fig 4.8

TRANSISTOR



Figure 4.9

Transistor is a semiconductor device. We are using transistor as switch. This are used to drive the MOSFET. We are using npn transistor (BC547). Transistors are three terminal active device produced using distinctive semiconductor materials that can go about as either a separator or a conductor by the utilization of a little sign voltage. The transistor's capacity to change between these two states empowers it to have two fundamental capacities: "exchanging" (computerized hardware) or "intensification" (simple gadgets). At that point bipolar transistors can work inside three unique regions.

CAPACITORS

Capacitors are also called as condensers and it provides constant voltage.

The structure of a capacitor comprises of two conductors separated by a nonconductor.

$C=Q/V$ where C is capacitance Q is charge V voltage

There is a variable capacitor used in the construction of the signal jammer circuit .the variable capacitor used is trimmer capacitor.

The trimmer capacitor is generally connected to loop antenna in a parallel way.

The capacitors used in the signal jammer circuit are

4.7pF

2pF

47pF

4.7uF

3.3pF

30pF (trimmer capacitor)



Fig 4.10



Fig 4.11



Fig 4.12

INDUCTOR

An inductor is also called as a coil or choke is nothing but device which works on the principle

It is a wire wound in either spirally or in a cylindrical form to get magnetic flux.

The coil is wound around the base known as core.

The core is made up of magnetic material



Fig 4.13

RF ANTENNA

RF antenna specifications

The frequency range of the RF antenna is 800MHz to 2100MHz

The power required is 12 volts DC, 85mA



Fig 4.14

CHAPTER 05

RESULT AND DISCUSSION

The connections are made as per the circuit diagram and a variation in the signal strength is seen.

Cell phones are of great use to the people across the world .The advantages of this circuit are many. Most of the jammer circuits block a single frequency but nowadays advanced circuits are being built to block several frequencies

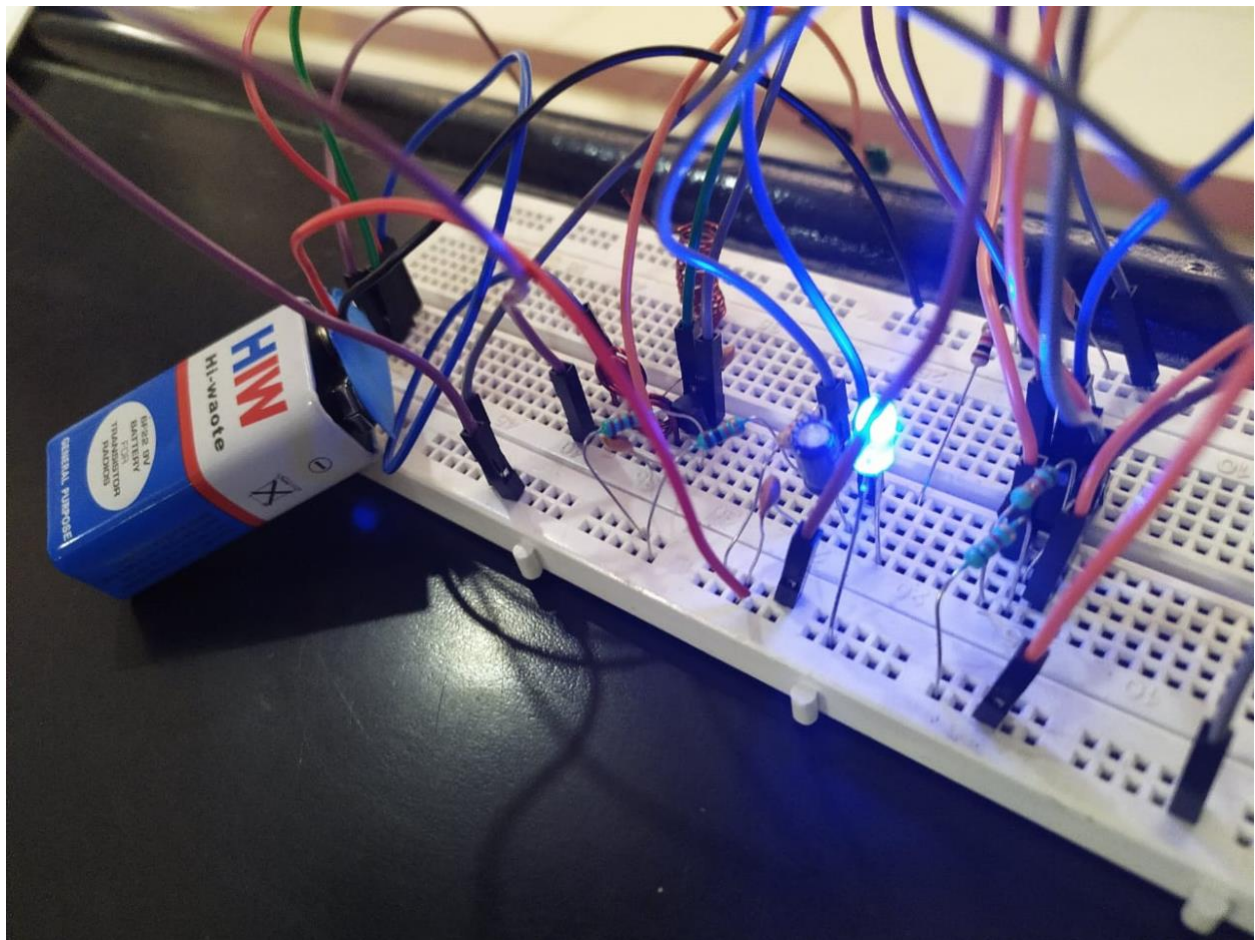


Fig 5.1

Project display

Capacitance	Signal strength
25Pf	-90dB
30pF	-115dB
35pF	-102dB
40pF	-85dB

Table 5.1

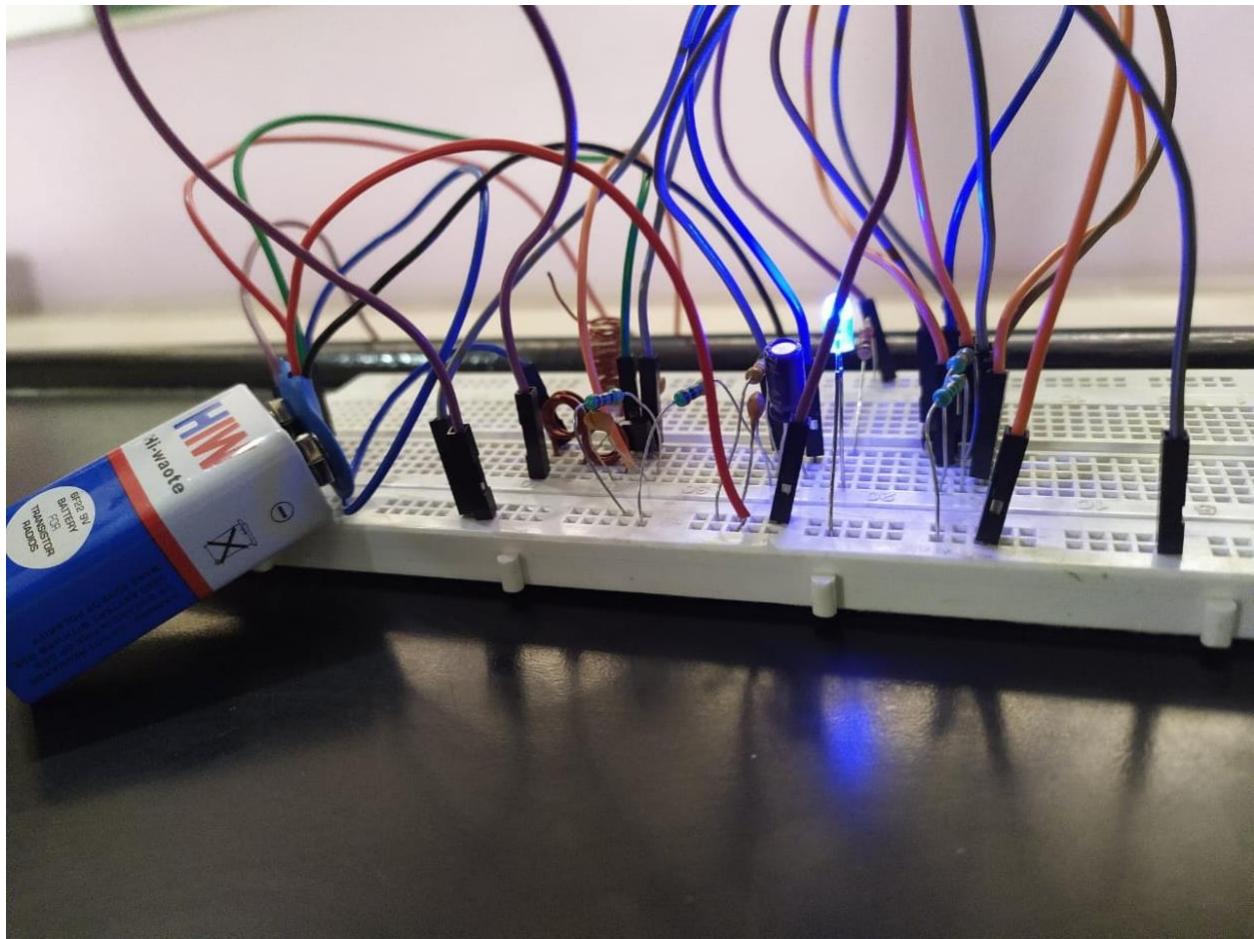


Fig 5.2 Side view

CHAPTER 06

CONCLUSION AND FUTURE SCOPE

The cell phone jammer circuit is used at many places like public places In theaters, halls, worship places and other places.

Phone jammers can be used at educational institutions and in workplaces .

The students cannot send messages and copy during examinations .

In places like prisons and detention centers also jammer circuits are used, to avoid the communication between the prisoners and visitors to avoid the criminal activities.

Places like theatres, health centers, libraries use mobile signal jammers to maintain silence.

Areas for future work will include developing a technique to detect and isolate the source of jamming in wireless sensor networks utilizing the parameters (RSSI, PDR, PSR, and CCA) that have been studied in this research while considering the findings in this study.

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APPENDIX

Older jammers sometimes were limited to working on phones using only analog or older digital mobile phone standards. Newer models such as the double and triple band jammers can block all widely used systems (AMPS, iDEN, GSM, et al) and are even very effective against newer phones which hop to different frequencies and systems when interfered with. As the dominant network technology and frequencies used for mobile phones vary worldwide, some work only in specific regions such as Europe or North America.

The power of the jammer's effect can vary widely based on factors such as proximity to towers, indoor and outdoor settings, presence of buildings and landscape, even temperature and humidity play a role.

There are concerns that crudely designed jammers may disrupt the functioning of medical devices such as pacemakers. However, like cell phones, most of the devices in common use operate at low enough power output (<1W) to avoid causing any problems.

Legality Owning, manufacturing, marketing, offering for sale or operating a cell phone jammer is punishable by an \$11,000 fine and up to a year in prison for each offense.

Richard Welch, associate chief of the FCC's Enforcement Bureau has stated that the agency has never seized a single jammer or prosecuted an operator. "We haven't taken any actions because nobody has complained," Welch said, adding that it was possible jammer users were simply flying under the FCC's radar.

Concern has been raised over the need of cell phones in emergencies or by doctors. Those who condone their use argue that they have a right to moderate cell phone use on their own property.

Most countries, (with notable exceptions such as Israel) have similar prohibitions on jamming devices based on older broadcast laws.

