SIGNAL JAMMER

ECB4232 DESIGN PROJECT-I

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BONAFIDE CERTIFICATE

Certified that this design project report "**SIGNAL JAMMER**" is the bonafide work of **N.RISHITHA (20121017), GUNAVANTH REDDY (20121018) and KARTHIK REDDY (20121029)** who carried out the design project work under my supervision during the academic year **2021- 2022.**

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ABSTRACT

This report presents the design, implementation, and testing process signals differently, and yet, all cell-phone-networks use radio-signals that can be interrupted or, even, blocked, completely. This project highlights the design of a simple low-cost signal jammer and aims to present a solution for the problem of inappropriate-use of the cell-phones in restricted and prohibited-areas.

The main concept of jamming is the releasing of signal (noise) of the same-frequency which is using by mobile-service-provider to overpower and destruct the user-signal. Overall recommendation is that further and more deeper-research is needed to produce more-sophisticated and better jamming devices, as not to affect the other base-station-transmission-systems.

ACKNOWLEDGEMENT

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INTRODUCTION

A Signal jammer is a device that blocks reception between cell towers and mobile phones. Cell phones continuously communicate with cellular base stations over the signal control channels. Signal Jammer transmits low power radio signals to cut-of communication between cell phone and cellular base-stations. It does not interfere with any communication other than cellular within the defined regulated zone.

Now a days cellular devices works on RF signal and those devices use wireless signals to connect the network. Jammer create a dead zone for the cell phone by giving a RF Signal at the same frequency expected by the device. The jamming signal itself a random noise. The device signal interference by the jammer signal, and then device cannot longer connect to the network. Jammer have different frequency signal.

PARTS OF SIGNAL JAMMER DEVICE :

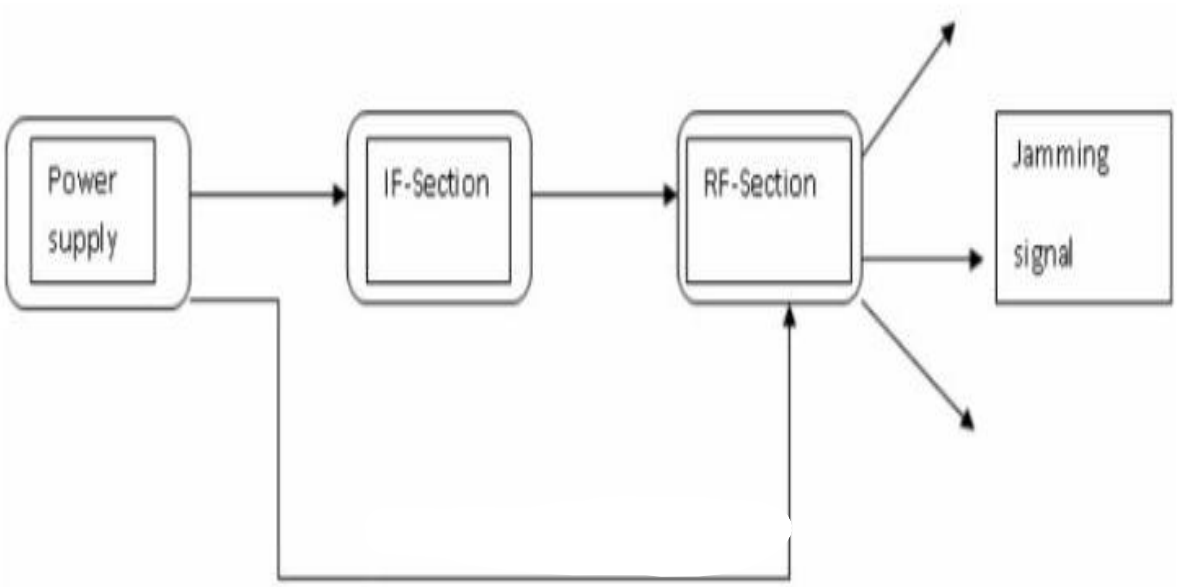


Figure 1 Jammer main blocks.

POWER SUPPLY:

The power supply is used to provide the power to the entire sections in the mobile jammer with the available voltage.

IF SECTION:

The IF section is just a triangular wave generator. With the help of desired range of frequencies the tuning section of the jammer brushes the VCO. To compensate the proper amount of VCO from the desired frequency to the maximum. The noise which is mixed with triangular waves is generated by the tuning signal.

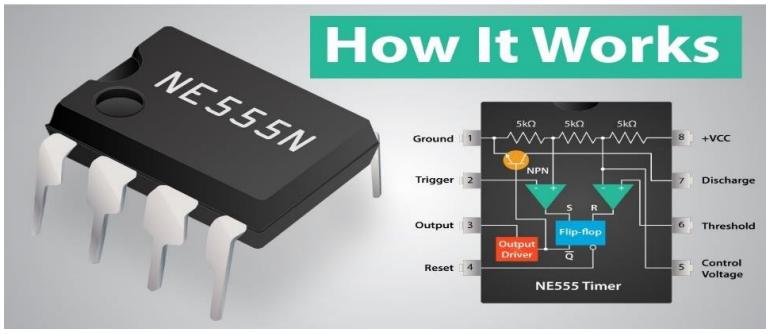
RF SECTION:

This is the most important part of the jammer, since the output of this section will be interfacing with the mobile. The RF-section consists of three main parts: voltage controlled oscillator VCO, power amplifier and antenna.

COMPONENTS :

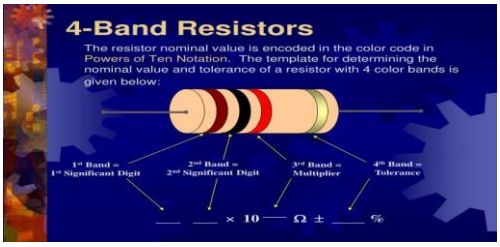
- 555 Timer IC
- Resistors – 220Ω x 2, 5.6KΩ, 6.8KΩ, 10KΩ, 82KΩ
- Capacitors – 2pF, 3.3pF, 4.7pF, 47pF, 0.1µF, 4.7µF, 47µF
- 30pF Trimmer Capacitor
- LED
- Coils 3 Turn 24 AWG, 4 Turn 24 AWG
- Antenna 15 Turn 24 AWG
- BF495 Transistor
- ON / OFF Switch
- 9V Battery

555 TIMER IC:



The **555 timer IC** is an integrated circuit (chip) used in a variety of timer, delay, pulse generation, and oscillator applications.

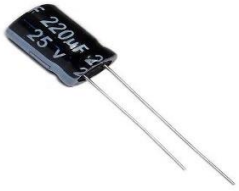
RESISTORS:



A **resistor** isa passive twoterminal electricalcomponent t hat implements electrical resistance as a circuit element.

CAPACITORS:

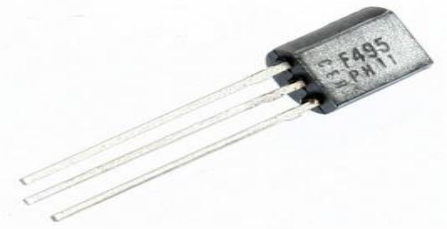
A **capacitor** is a device that stores electrical energy in an electric field. It isa passive electroniccomponent with two terminals.



30PF TRIMMER CAPACITOR:

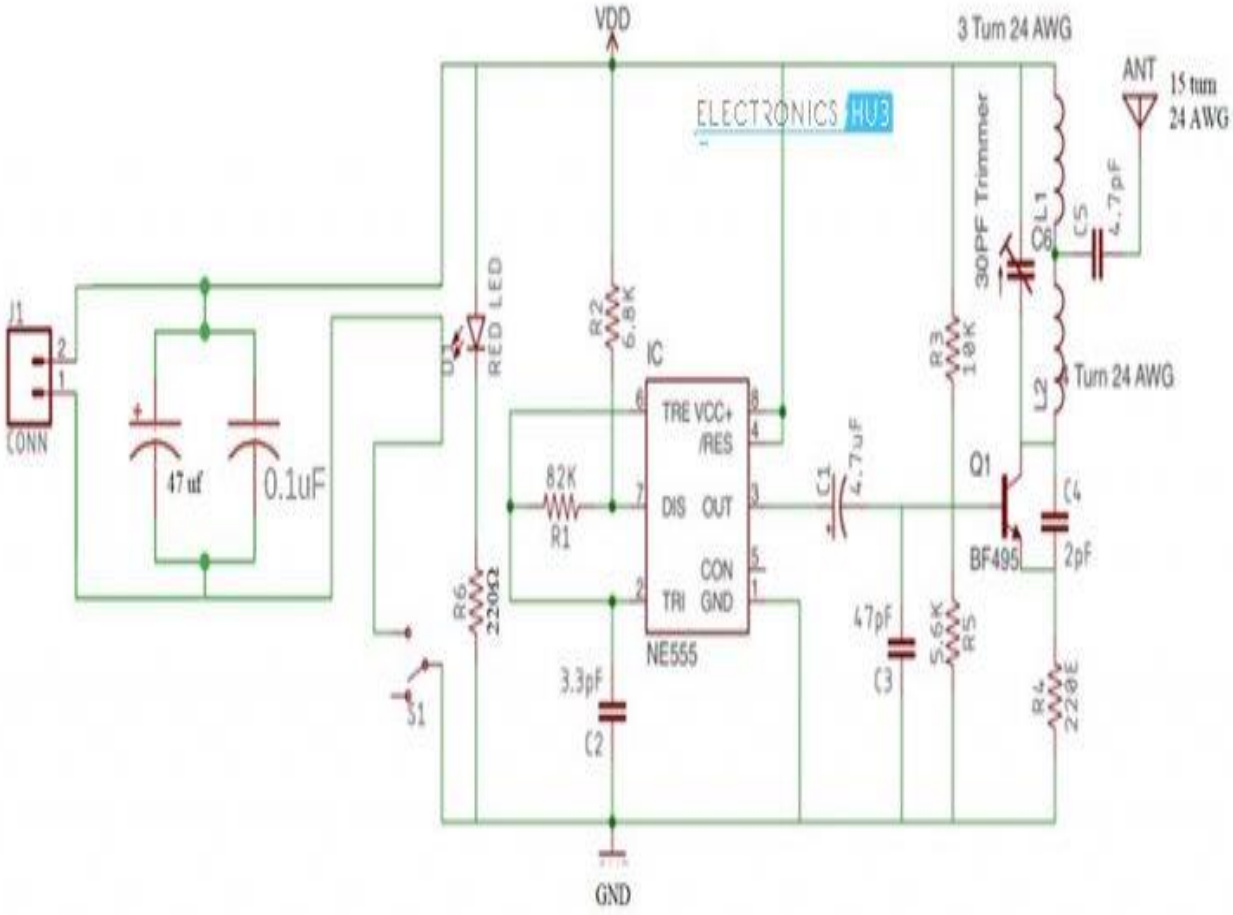
A trimmer, or preset, is a miniature adjustable electrical component. It is meant to be set correctly when installed in some device, and never seen or adjusted by the device's user.

BF495 TRANSISTOR:

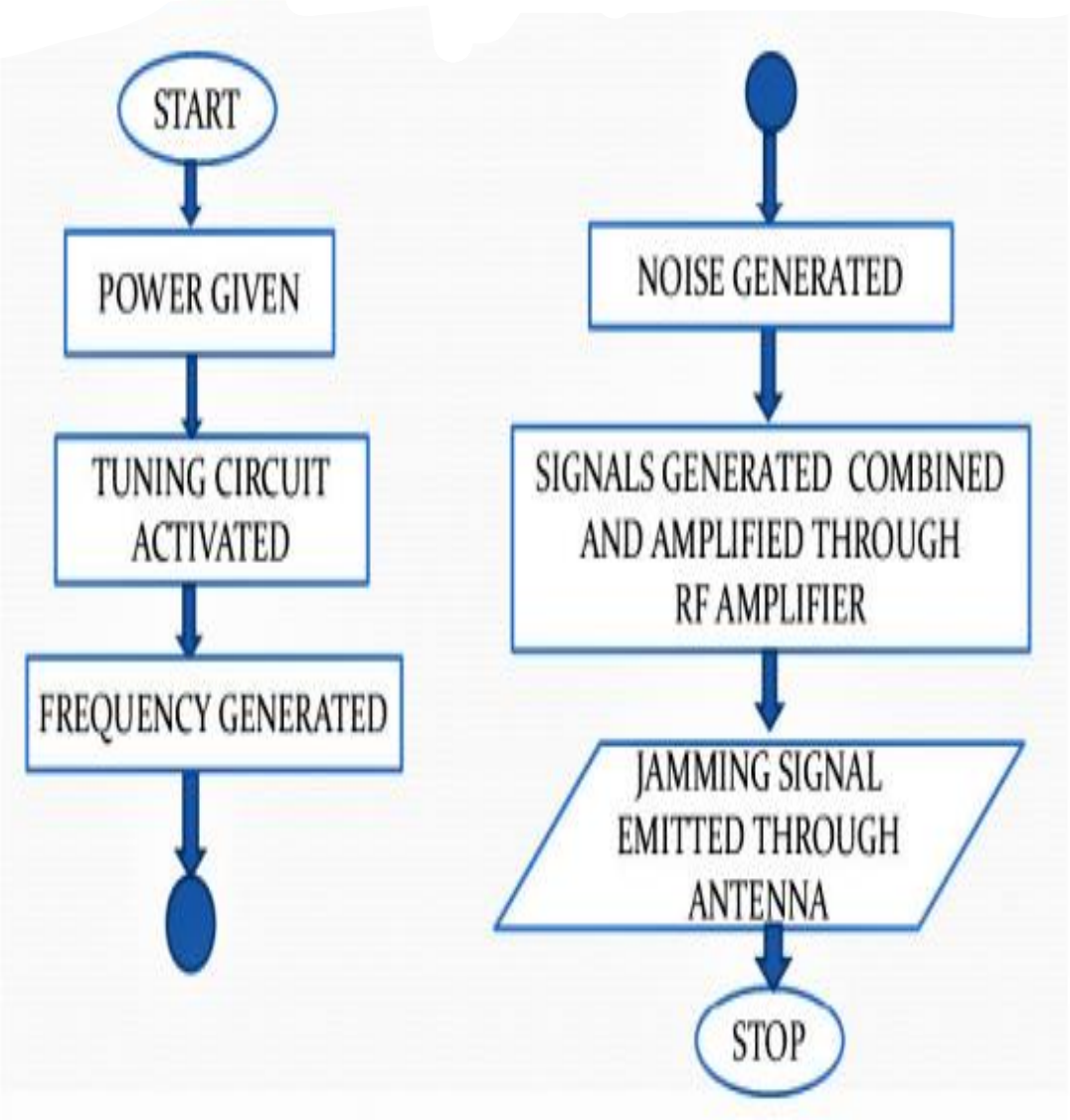


A transistor is a semiconductor device used to amplify or switch electronic signals and electrical power. Transistors are one of the basic building blocks of modern electronics.

CIRCUIT DIAGRAM:



FLOW CHART:


START
POWER GIVEN
TUNING CIRCUIT ACTIVATED
FREQUENCY GENERATED
NOISE GENERATED
SIGNALS GENERATED COMBINED AND AMPLIFIED THROUGH RF AMPLIFIER
JAMMING SIGNAL EMITTED THROUGH ANTENNA
STOP

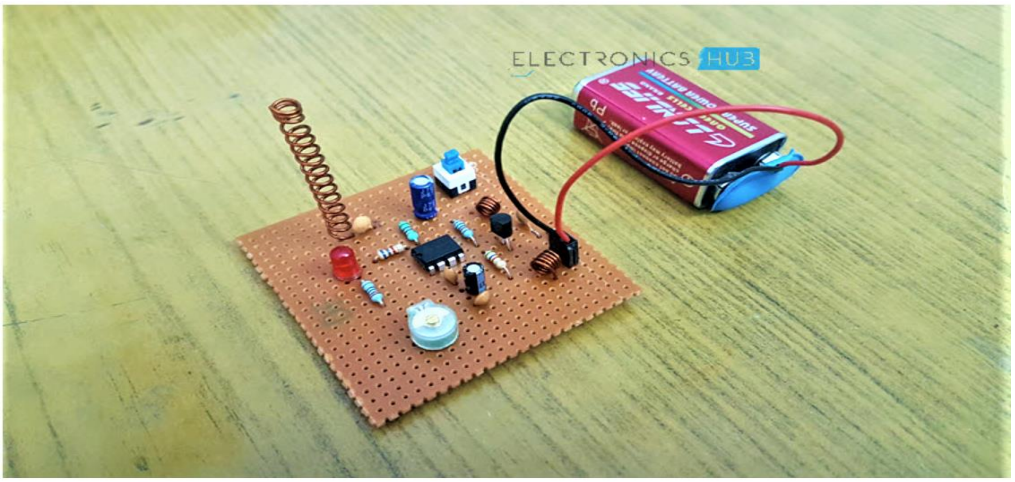
HISTORY:

- The Act of jamming signals was widely used during World War II and the Cold War.
- Besides using it to disrupt messages from reaching their intended countries, jamming of broadcast stations was also propagated back then.
- During the Cold War period, the broadcasters from the Soviet and the West even battled in a “power race” in which the jammers worked to increase their transmission powers.
- The Situation started changing at the end of the Cold War. As the Soviet Union fell from power, the Western forces gained more traction and control over innovation and technology in general.
- However, with no need for “signal battles,” signal jamming was also classified as an illegal act among many countries, with the exception being for government, military, and defense applications.
- The concept of jamming started theoretically to the dawn of radio communication.
- The idea progressed through Cold War era and in various conflicts most importantly Vietnam war and Arab-Israeli wars.

OPERATION:

- After building this circuit on a perf board and supplying power to it, I have placed a mobile phone near the circuit (I am yet to turn on the switch). Before turning on the power, my mobile phone was able to capture majority of the signals as it is displaying full bars.

- Once I turned on the circuit, the signal bars on the phone started to reduce and finally it stopped at a single bar.



MERITS:

- One of the initial benefits of using phone jammer is, the device can block any mobile signal from base station.
- If you are a business owner, you know that most of your company's employees are going to be gabbing on their cell phones all the time. If you use these jammers, you can block out the signals so you do not worry about people coming to your organization.
- Apart from this, it also helps you to save your trade secrets by blocking the signals so employees do not able to send your information to others in the form of pictures.
- It helps people not to be distracted from their work. Sometimes, people have to attend calls even if they are talking to the owners or in a meeting.
- The jamming devices help the people able do not interrupted by their phones during their important conversations.
- Sometimes, the device is also helpful in prevention of terrorist actions by blocking signals of a mobile phone.

DEMERITS:

- Cost oriented.
- Requires special hardware.
- People feel inconvenience.
- V.I.P.'s may loose some important calls.
- Envisage a situation where you are essaying to dial 911 and cannot get through because someone has a cell phone jammer with him.
- Otherwise, you want to call the police to avoid a robbery in your building but the robber has a cell phone jammer with him.

Jammer off

jammer on

Jammer off

jammer on

RESULT:

As we tested our jamming device, the result was a full success. The device was able to generate the nosie and the effective jamming range was around 30 meters.

This is more than what it was designed for. The reason is that in our calculations, we considered the worst case of having the cell phone close to the base station. It is expected that as the distance between the cell phone and the base station increases, the effective jamming distance will increase.

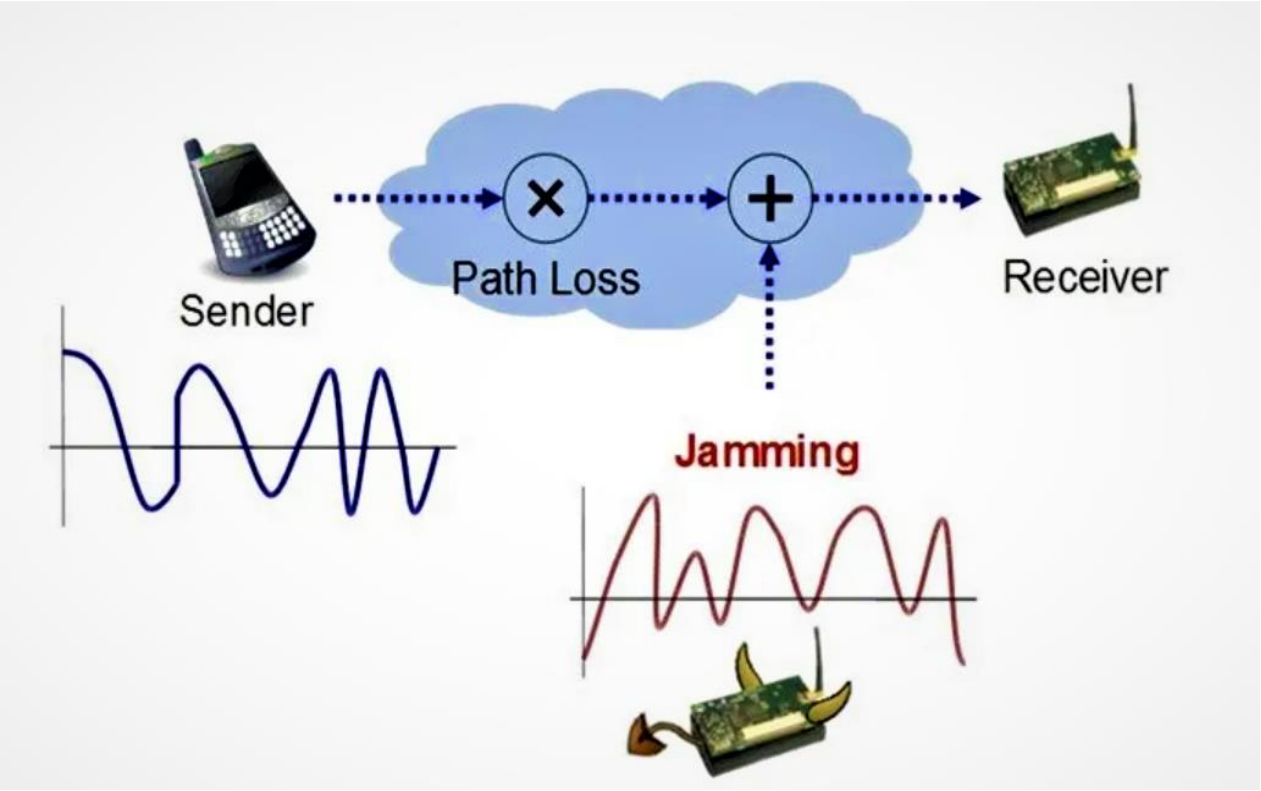
This is due to the fact that the amount of power reaching the cell phone from the base station decreases as the cell phone moves farther from the base station. The Figure in the next page shows the results. It can be clearly seen that the signal is "ON" when the jammer is "OFF", while the signal disappears when the jammer is "ON"

APPLICATIONS:

- The possible application areas of jamming system are
- Counter terrorism threats such as remotely detonated bombs in high risk areas.
- Eliminate public nuisance in places like movie theaters, restaurants and temples.
- Mobile cell phone jammers are made for use with defense sector, but later it was spread across to use for religious places like temples, churches.
- You will fine mobile phone jammers in cinema halls, cricket stadiums, office premises where business meetings are held.
- Hence the mobile cell phone jamming device works well when people forget to switch off their mobile phone and there would be no ringing of any mobiles and the meeting can continue peacefully

PREVENTION TECHNIQUES:

- Jamming can be avoided using multiple frequencies and changing them randomly.
- Jamming can also be prevented by increasing transmitted power
- The point where transmitter power overcomes the jamming signal is known as burn-through.



CONCLUSION:

In this paper we addressed the problem of selective jamming attacks under an internal threat model, where the attacker isa part of the network, who is aware of network secrets andalso the implementation details.

In order to overcome these kinds of attacks we develop three schemes that combine cryptographic primitives such as strong hiding commitmen tscheme, cryptographic puzzle hiding scheme and all or nothing transformations. We analyze the security of abovementioned schemes and through simulation we can achieve the higher throughput by analyzing the comparative study of these schemes.

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