

Mobile Signal Jammer

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Abstract:- This paper presents the mobile Jammer for GSM with a fixed range. The jammer broadcast a radio frequency similar to that of the mobile and interferes with the signal of the mobile phone that results “No network available” display on the mobile screen. We have experimented with a lot of frequencies and found after tuning and comparison the best frequency for jamming the mobile phone.

Keywords:- Mobile Signal Jammer, NE555 Timer, Cell Phone, Resister, Capacitor.

I. INTRODUCTION

The cell phone are two way handheld radio. They work by communicating with the radio frequency of the mobile phone tower. when the mobile phone user is moving from one place to another the signal shifts from one tower to another. A mobile phone jammer works by preventing mobile phones from receiving signals from the cell phone tower.

As the cell phone jammer Also known as “Radio Jammers” was first invented in the times of world war II to mislead Pilots in their own language and to prevent them from reaching their destination this method was known more as a “spoofing” rather than jamming. The “Radio jammer” was also as used to prevent citizen from listening to enemy broadcast.

As they send the signal at the same radio frequency as they the mobile phones this then confuses the mobile phone by cancelling out the frequency and thus blocking the signal of the mobile phone.

It is mostly used in office meetings, churches, mosques e.t.c where silence is necessary. But the possession and use of mobile phone jammer is forbidden in many countries like India unless you have a specific permit.

➤ Jamming Efficiency

When the usability of the communication is cancelled then we can say that the jamming is successful. When the Error rate of transaction cannot comprehend the error correction then the usability is denied in digital world. Which means a successful jamming requires both jammers and mobile phones power to be roughly equal. The attack by Mobile phone jammer comes under the category of denial of service attack. This equation can help us to understand the basic jamming-to-signal ratio.

$$\frac{J}{S} = \frac{P_j G_{jr} G_{rj} R_r^2 L_r B_r}{P_t G_r G_{rt} R_{jr}^2 L_j B_j}$$

Fig 1

- B_j=jamming transmission bandwidth.
- B_r=communication transmission bandwidth.
- L_r=communication signal loss.
- L_j=jammer signal loss.
- R_r=range between communication transmitter and receiver.
- R_j=range between jammer and communication receiver.
- G_{rt}=antenna gain from receiver to transmitter.
- G_r=antenna gained from transmitter to receiver.
- G_{rj}=antenna gained from receiver to jammer.
- G_{jr}=antenna gained from jammer to receiver.
- P_t=transmission power
- P_j=jammer power

This equation indicates that jammer effective radiated power which is the result of output power and antenna gain should be high if jamming efficiency is required.

As the equation shows the relation between azimuth and the gain, the antenna pattern is very important.

Equation for Determining Jammer frequency

$$F = 1 / (2 * \pi * \sqrt{L1 * C1})$$

And depending on the frequency to block the L1 and C1 can be altered.

For example: if in our area 800 MHZ(regular frequency for GSM) frequency is used for mobile phones we need to generate an 800 MHZ with some noise to block the signal then the cell phone receiver would not understand which signal to receive.

➤ Hardware System Design

The main part of the mobile phone jammer are the RF, IF, and the Power Supply which are also represented in the block diagram below.

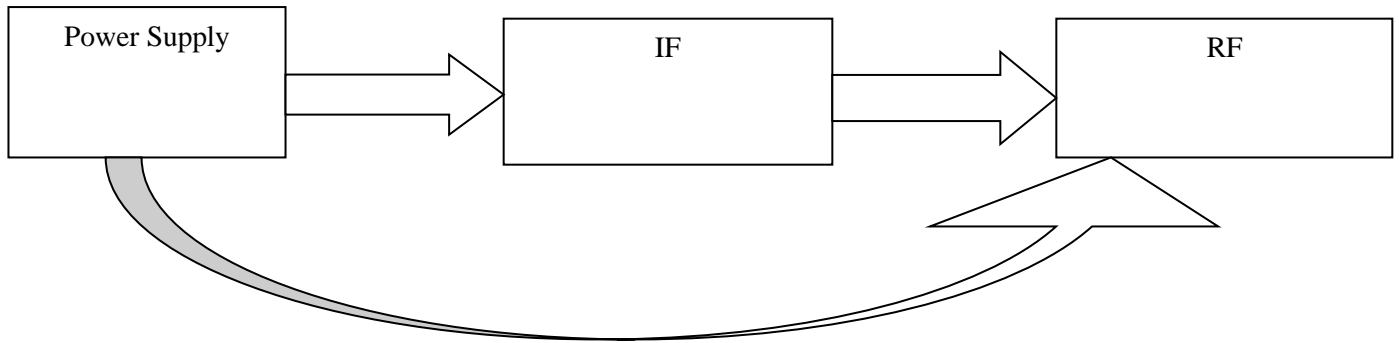


Fig 2:- Block Diagram

➤ *RF Section*

This is the most important section as this section contains (VCO) voltage control oscillator, antenna, and the RF power amplifier. the selection of these components is according to the specification of jammer such as frequency range and coverage range.

➤ *IF Section*

The IF section consist of Noise generator, mixer and the triangular wave generator. it is also known as triangular or saw tooth wave generator. The desired range of frequency is generated to help the turning section of the jammer brush the VCO. The turning signal generates the triangular or saw tooth wave.

➤ *Power Supply*

Small jammers like which we made are battery powered. Some even look like a cell phone and use mobile batteries but the stronger signal jammers can be plugged into car battery or an A.C power socket. The RF and IF requires +5,+9 and -9 Dc Voltages. The power supply consists of the four following components.

II. SYSTEM COMPONENTS

- Transformer: is works as a step down voltage as it takes input of 220V(mainly used in big signal jammers)
- Rectifier: it is used to convert the AC voltage to DC Voltage and it can be accomplished by one of two methods
- Half wave rectifiers: during this the input signal should be positive
- Full Wave Rectifier: in this kind of rectifier the input signal can be either positive or negative hence the output voltage will appear (we have used the full wave rectifier in our signal jammer)
- Filter: the large capacitors are used to minimize the ripple in output as it eliminates the fluctuation in output of the full wave rectifier thus producing a constant DC Voltage.

- Voltage Control Oscillator: this generates the radio frequency signal which overpowers the mobile phones downlink signal (we have used NE555 for that)

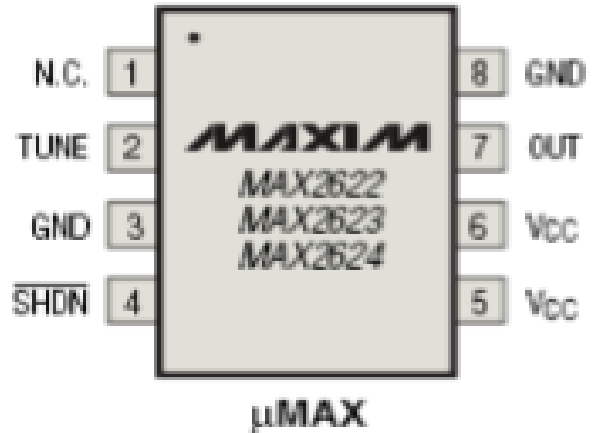


Fig 3

- RF power amplifier: this is used to achieve the desired output DV Voltage.
- Antenna: it is the most important part of this signal jammer therefore a suitable antenna should be selected. the 24 AWG wire coiled 15 turns is used as the antenna here. But a ¼ wave monopole antenna which has minimum of 50 ohm impedance should might be better for the making an AC Voltage signal jammer.

➤ *Board Hardware Resource features*

The Cell phone Jammers are basically radio frequency jammers designed to interfere with the licensed service operated by the mobile phones. They work by cutting the signal between mobiles and the base station there mobiles does not attempt to transmit to the base station even though they may be in range.

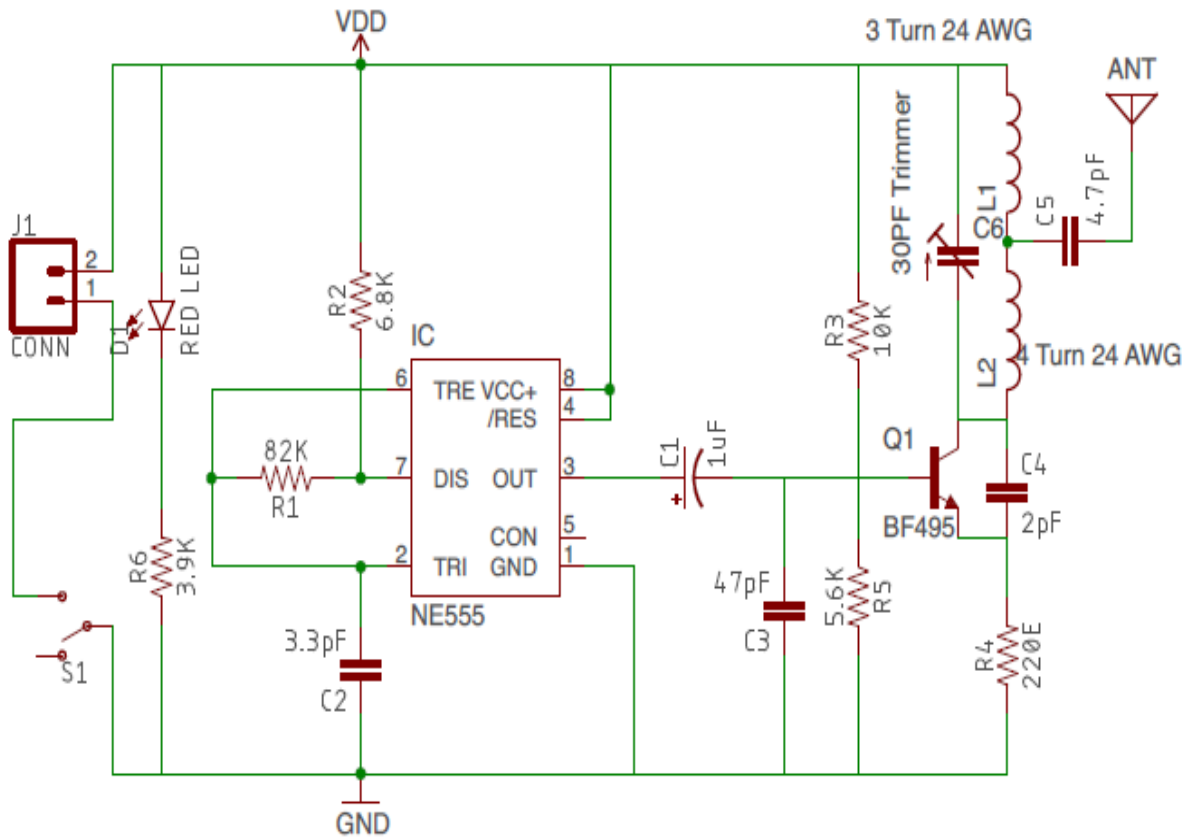


Fig 4:- Circuit Diagram of Our Signal Jammer

➤ Components Used To Make This Signal Jammer

- 9V Battery
- 9V Battery Connector
- 2 Pin Male Header Connector
- 3mm LED
- A mini slide switch
- 24 AWG Copper wire
- 5.6k resistor
- 220E resistor
- 82k resistor
- 10k resistor
- 1uF 63V Electrolytic Capacitor
- 30pf trimmer capacitor
- 47pf ceramic capacitor
- 3.3pf ceramic capacitor
- 4.7pf ceramic capacitor
- 2pf ceramic capacitor
- BF495 Transistor
- NE555 Timer
- PCB Board
- Wires

III. METHODOLOGY

Our devices transmit the similar radio frequency which is either equal to or have greater power than the mobile phone. As cell phones are full duplex devices that means that they use two separate frequencies one is used for talking and the other is used for listening. As all cell phones use radio frequencies it is not hard to interrupt with them. For example A GSM mobile operates in 900 MHZ And 1800 MHZ. The Cell phone Jammer broadcast on the same frequencies to block the frequencies of the cell phone thus resulting in “No Network Available” message being displayed on the mobile screen.

Steps used in the system

- Take a PCB board.
- Add the connector pins for the battery.
- Connect one negative end of the battery wire to the switch and the positive end to the LED Light (for indication).
- Connect the LED light wire to the R6 (3.9k) resistor and the negative wire to the C2 (3.3pf) capacitor.
- Connect the positive wire to the R2 (6.8k) resistor and the

- Now connect the wires of R1 to the 7th pin (DIS) of NE555 timer and the wire of C2 to 2nd pin (TRI) of NE555 timer and the wire of R1 to 6th pin (TRE) of NE555 timer.
- Connect the 8th pin (RES) to the VDD connecting R2 and the 1st pin (GND) to the ground.
- Connect the 4th pin to R3(10k) resistor along with R5 (5.6k) resistor connecting both to the switch and connect the switch wire to the C3 (4.7pf) capacitor which will be connected to C1.
- Connect the 3rd pin of NE555 timer to the C1 (1 μ f) electrolytic capacitor. Connect C1 to the base of BF495 transistor.
- Connect the collector of BN495 to 30 pf trimmer capacitor and the emitter to the R4 (220E) resistor and connect one end of R4 to the switch wire And the other end to the C4 (2pf) capacitor.
- Connect the 4turn 24AWG wire in series of 3 turn 24 AWG wire parallel to the 30 pf trimmer capacitor.
- Put a wire in between the 4 turn and the 3 turn AWG wire and connect the C5 (47pf) capacitor to one end of the wire and connect the other end of C5 to the antenna of the signal jammer.

IV. OBSERVATION

As the signal jammer is turned the red light will show that the signal jammer is working properly and when we take our GSM 900 mobile near the signal jammer the network vanishes and we can observe “No Network Available” on the screen. On the other hand if we take the cell phone away from the signal jammer about 10 meters the jammer starts to lose the range and the network starts to reappear.

V. CONCLUSION

This jammer is tested successfully against an GSM 900 network (on the Nokia 3300) and has proven successful within 1 second of activity and within 1 meter of signal range and can be extended to 10 meters. The thing which was protect a GSM network from Jamming was the network signal power but having a large jamming device the GSM Network could be jammed for sure .From this project we can conclude that a normal GSM Mobile is Vulnerable against jamming attack and can be easily jammed by a portable signal jammer.

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