

Mobile Jammer Project

Abstract:

Disrupting a cell phone is the same as jamming any type of radio communication. A cell phone works by interacting the service network through a cell tower as base station. Cell towers divide a city into small areas or cells. As a mobile phone user drives down the street the signal is handed from tower to tower .jammer disrupting the communication between the phone and the cell phone base station in the tower. Its called denial-of-service attack. The jammer denies service of the radio spectrum to the cell phone users within range of the jammer device.

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Introduction:

A Mobile Jammer Circuit or a Cell Phone Jammer Circuit is an instrument or device that can prevent the reception of signals by Mobile Phones. Basically, a Mobile Jammer Circuit is an RF Transmitter, which broadcasts Radio Signals in the same (or similar) frequency range of the GSM Communication.

Literature Review:

The rapid proliferation of mobile phones at the beginning of the 21st century to near ubiquitous/ever present status eventually raised problems such as their potential use to invade privacy or contribute to rising and prominent academic cheating. In addition public backlash was growing against the intrusive disruption cell phones introduced in daily life. While older analogue mobile phones often suffered from chronically poor reception and could even be disconnected by simple interference such as high frequency noise, increasingly sophisticated digital phones have led to more elaborate counters. Mobile phone jamming devices are an alternative to more expensive measures against mobile phones, such as Faraday cages, which are mostly suitable as built in protection for structures. They were originally developed for law enforcement and the military to interrupt communications by criminals and terrorists. Some were also designed to foil the use of certain remotely detonated explosives. The civilian applications were apparent, so over time many companies originally contracted to design jammers for government use switched over to sell these devices to private entities. Since then, there has been a slow but steady increase in their purchase and use, especially in major metropolitan areas

Methodology:

For any jammer circuit, there are three main important circuits. When they are combined together, the output of that circuit will work as a jammer. The three circuits are

- RF amplifier.
- Voltage controlled oscillator.
- Tuning circuit.

So the transistor Q1, capacitors C4 & C5 and resistor R1 constitute the RF amplifier circuit. This will amplify the signal generated by the tuned circuit. The amplification signal is given to the antenna through C6 capacitor. Capacitor C6 will remove the DC and allow only the AC signal which is transmitted in the air.

When the transistor Q1 is turned ON, the tuned circuit at the collector will get turned ON. The tuned circuit consists of capacitor C1 and inductor L1. This tuned circuit will act as an oscillator with zero resistance.

This oscillator or tuned circuit will produce the very high frequency with minimum damping. The both inductor and capacitor of tuned circuit will oscillate at its resonating frequency.

When the circuit gets ON, the voltage is stored by the capacitor according to its capacity. The main function of capacitor is to store electric energy. Once the capacitor is completely charged, it will allow the charge to flow through inductor. We know that inductor is used to store magnetic energy. When the current is flowing across the inductor, it will store the magnetic energy by this voltage across the capacitor and will get decreased, at some point complete magnetic energy is stored by inductor and the charge or voltage across the capacitor will be zero.

The magnetic charge through the inductor will decrease and the current will charge the capacitor in opposite or reverse polarity manner. Again after some period of time, capacitor will get completely charged and magnetic energy across the inductor will be completely zero. Again the capacitor will give charge to the inductor and becomes zero. After some time, inductor will give charge to capacitor and become zero and they will oscillate and generate the frequency.

This circle run upto the internal resistance is generated and oscillations will get stop. RF amplifier feed is given through the capacitor C5 to the collector terminal before C6 for gain or like a boost signal to the tuned circuit signal. The capacitors C2 and C3 are used for generating the noise for the frequency generated by the tuned circuit. Capacitors C2 and C3 will generate the electronic pulses in some random fashion (technically called noise). The feedback back or boost given by the RF amplifier, frequency generated by the tuned circuit, the noise signal generated by the capacitors C2 and C3 will be combined, amplified and transmitted to the air.

Cell phone works at the frequency of 450 MHz frequency. To block this 450MHz frequency, we also need to generate 450Mhz frequency with some noise which will act as simple blocking signal, because cell phone receiver will not be able to understand to which signal it has been received. By this, we can able to block the cell phone signal from reaching the cell phones.

So here in the above circuit, we generated the 450 MHz frequency to block the actual cell phone signal. That's what the above circuit will act as a jammer for blocking the actual signal.

Required Components:

- 555 Timer IC
- Resistors – $220\Omega \times 2$, $5.6K\Omega$, $6.8K\Omega$, $10K\Omega$, $82K\Omega$
- Capacitors – $2pF$, $3.3pF$, $4.7pF$, $47pF$, $0.1\mu F$, $4.7\mu F$, $47\mu F$
- $30pF$ Trimmer Capacitor
- LED
- Coils 3 Turn 24 AWG, 4 Turn 24 AWG
- Antenna 15 Turn 24 AWG
- BF495 Transistor
- ON / OFF Switch
- 9V Battery

Diagram:

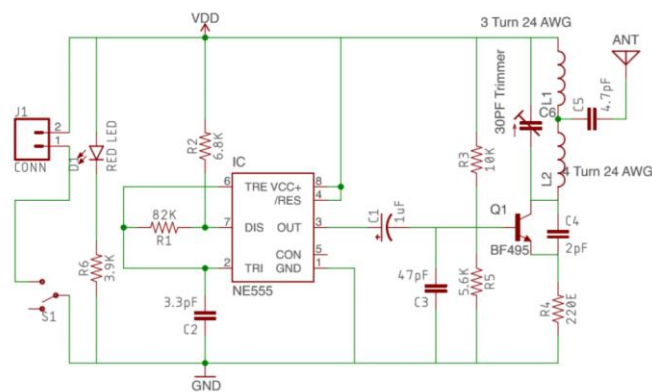


Figure -01: Circuit Diagram of mobile jammer .

Hardware:

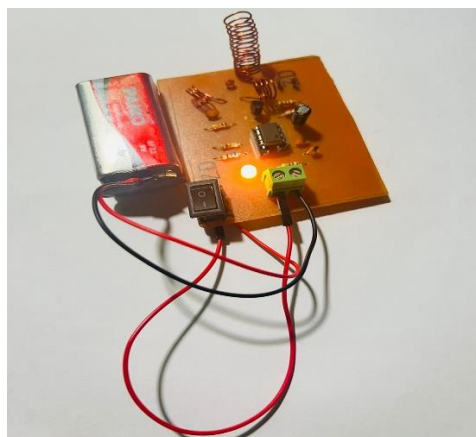


Figure -02: Hardware implementation of mobile jammer circuit.

Simulation:

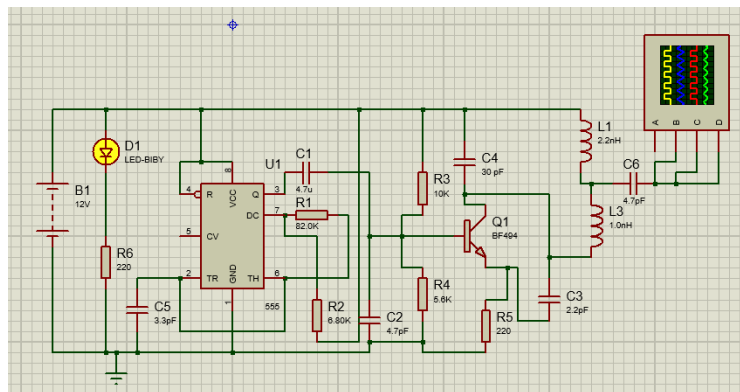


Figure -03: Simulated Circuit Diagram of mobile jammer .

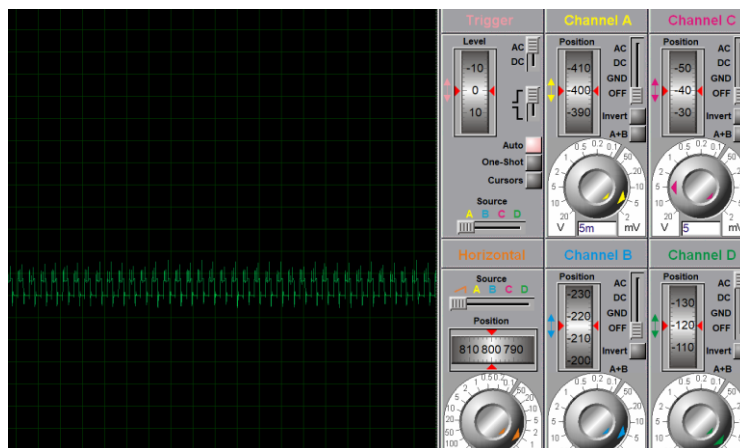


Figure -04: Simulated Output waveform of mobile jammer circuit.

PCB Layout :

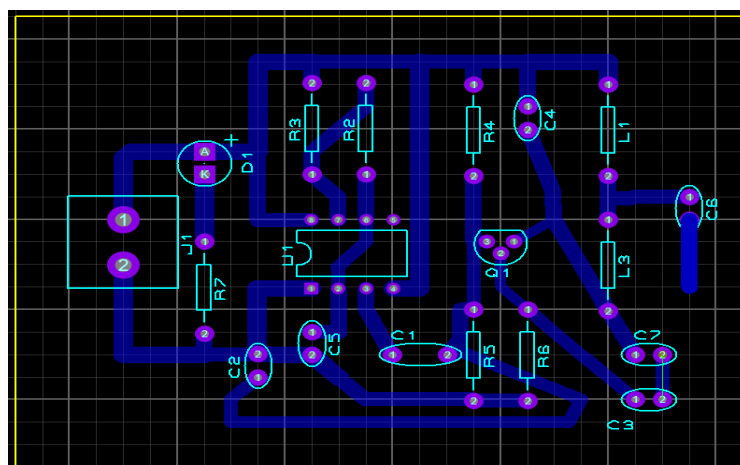


Figure -05: PCB layout of mobile jammer circuit .

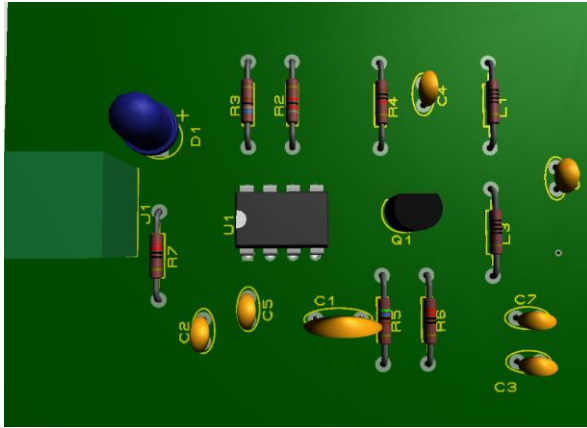


Figure -06: PCB 3D topview of mobile jammer .

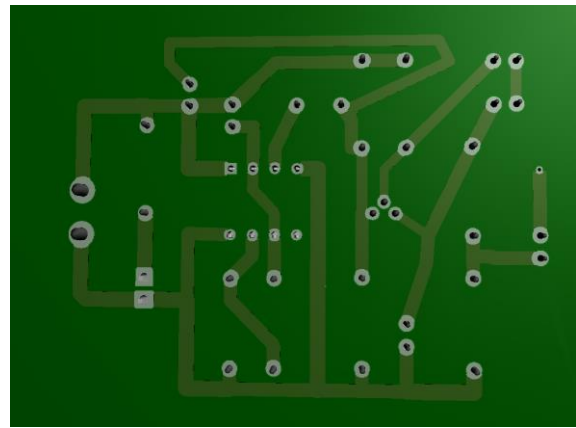


Figure -07: PCB 3D bottom view of mobile jammer .

Application:

1. **Limit cellphone activity** – Jammers are commonly used for limiting the use of a cellphone in certain areas and buildings. One of the most common places where one can witness a jammer in action is a prison. Cellphone jammers are able to prevent unwanted cellphone calls between the prisoners and the outside world, helping prevent any illegal activity.
2. **Stop cheating** - Jammers are also heavily used by educational institutions. By installing a signal jammer in the campus that covers nearly the whole establishment, schools and universities can successfully thwart cheaters.
3. **Stop snooping attempts** - Jammers can be utilized to prevent spying or bugging attempts. It has become pretty easy for someone to conceal an audio transmitting device inside an item left at the home or workspace. A jammer can easily block the attempts of eavesdroppers by blocking the bug's receiver and preventing it from receiving commands from its operator.

Result:

As per the simulation shows, this jamming device creates the same frequency as like the frequency of the transmission. These same frequency overlap each other and creates a new noise frequency. Hence the message signal becomes distorted and so the communication is interrupted.

Reference:

1. Wikipedia: http://en.wikipedia.org/wiki/Mobile_phone_jammer
2. Multitopic conference2008.INMIC 2008.IEEE International
3. Google Scholar
4. Webtronics Website: <http://www.webtronics.com/20wesdighard.html>