



## Cell Phone Signal Disable System

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**Received:** June 17, 2022

**Published:** July 18, 2022

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### Abstract

Cell Phone Signal Disable System is the same as mobile phone, it works by generating a noise signal at a frequency higher compare to frequency in which mobile phone communicate with mobile station. This work present the report of design and implementation of Cell Phone Signal Disable System using 555 Timer IC and other electronic components mentioned in methodology and design section. It was discovered that cell phones placed at close range within the designed system has no service after about five minutes that the system was powered ON. It was discovered that increase in the value of the resistors and capacitors could result to increase efficiency and power of the cell phone signal disable system.

**Keywords:** Cell Towers; Cell Phone; Mobile Station; Signal Disable System; Denial-of-service Attack

### Introduction

Cell phone, also refers to as mobile phone is a device that uses full duplex mode of communication for communication between both ends using two frequencies, one for talking and another one for listening [1]. A cell is typically the area around the tower in which a signal can be received. Cells are the geographic areas which when connected make up mobile communication network. The cell system is planned to ensure that cell phones maintain the link with the network as users move from one cell to another via a base station that consists of a tower and a small building containing radio equipment's [2]. Communication process using cell phone start with registration, a process in which cell phone reaches the nearest base-station and establishes a communication [3].

Two close cells can make use of the same frequencies greatly across a limited area because transmission of frequencies between

a cell tower and the cell phone within its cell does not make it far outside the cell [4].

Cell phone deactivator is a device that capable of transmitting interfering signal to disrupt the normal operation of cell phones and other mobile services. The cell phone deactivator transmits signal with a strength greater compare to that of cell phone operating frequency so that when both signals collide it will cancel cell phone-out and no service action invoke. Cell phone deactivator can also be used to thwart the use of remotely discharged explosives [5,6]. Cell phone deactivator make use method refers to as denial-of-service attack which is the same as jamming any other type of radio-communication [7]. The power of the Blocker can typically be measured in Watts or dBm and jamming distance of a cell-phone-blocker can vary from a few meters for pocket mobile blockers to kilometers for more-sophisticated mobile blockers [8]. The

over usage of mobile phones in specific areas where silence is appreciated and the ringing or general use of mobile phones are not allowed informed use of cell phone deactivator by civilians [10,11].

It is good to connect with people 24 hours of the day but some areas do not allow the use of cell phone as it cause distraction and it's a form of disturbance to them. Due to the ignorance of warning signs and the continuous use of mobile phones in these areas in which the use of mobile phones is prohibited and in areas in which silence is appreciated, areas like churches, mosques, classrooms, libraries, airplanes, meetings, music halls and cinema halls. The achievement of the aim of this work which is the development of cell phone deactivator will checkmate the use of the mobile phone where it is restricted.

### Literature Review

Cell phones have become a sine-qua-non to existence of human and organization, the mass production of handheld mobile phone was champion by Motorola in the year 1973. This early cellphones are commonly referred to as 0G or zero generation phones. The majority of today's phones use 3G, 4G or 5g mobile technology [12]. Mobile phone generation and it updates comes due to one reason or the other. 1G technology is a voice analog phone system that transmits radio signals utilizing circuited switching technology and all voice calls are frequency modulated and transmitted using frequency division multiple access (FDMA) technology [13,14]. The second generation of cell phone allows data and voice services such as short message services (SMS), multimedia message services (MMS), and e-mail to be combined with high capacity and It adheres to the time division multiple access (TDMA) and code division multiple access (CDMA) standards for digital multiple access [15]. The 3g uses a universal mobile telecommunication standard (UMTS) which is supported by two key technologies: UMTS and CDMA2000, with 3GPP and 3GPP2 support, respectively [16]. 4G technology was introduced to meet basic standards to enhance quality of service (QOS) and data rate, the 4g technology leads to emergency of apps to do the following MMS, Video chat, HDTV, digital video broadcasting (DVB). 4G addressed position t and handoff management [17,18].

Mobile base station is a mobile device site that housed antennas and electronic communications equipment's positioned on a

radio mast, tower, or other raised structure to create a cell in a cellular network. It supports one or more sets of transmitter/receivers transceivers, digital signal processors, control electronics, for signal transmission (Cell site, n.d.). Cell phone signal is strongest when phones are in close proximity to mobile station, as people use cell phones to make calls, signals are transmitted back and forth to the base station. Cell signals can be badly affected building materials like brick, steel, concrete and LEED-certified glass windows and increase in population of mobile devices competing for signal from mobile station [19,20].

Currently mobile phone deactivator are of two types: the first type is made up of a devices that block the signals coming from cell mobile base station towers to individual cell phones and the frequency it can block range between 800MHz and1900MHz. It can block signal within a distance of 30-foot radius where phone will show no signal. The second one cover larger distance from about 5 mile radius, and it capable of blocking the transmission of signal rom satellite and normally been used for military operation. Own or operation of cell phone blocker is illegal in most places, In Nigeria it is illegal to sell, install or use any Radio Frequency (RF) blocking device without authorization of Nigerian Communications Commission (NCC) [21,22].

### Material and Methods

The propose system is a portable cell phone deactivator which can deactivate cell phone signal within the frequency range of 800MHz and1900MHz, the proposed system will use 9v battery that can be easily be replaced when it run-down.

The proposed system is made up of three sub-units.

- **Power Section:** The mobile blocker will be battery operated. It will make use of a 9 volt battery for its Power supply.
- **IF-Section:** The function of the IF-section of the mobile blocker is to generate the tuning signal for the voltage-controlled oscillator (VCO) in The RF-Section, which will sweep the VCO through the desired range of frequencies.
- **RF-Section:** The RF-section is the most important part of the mobile blocker it consist of the Voltage Controlled Oscillator (VCO), RF Power amplifiers, and the antenna.

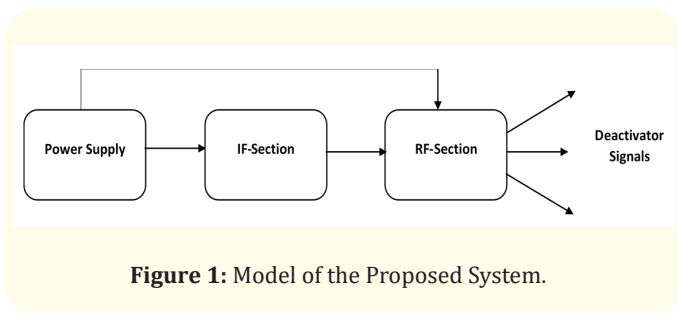


Figure 1: Model of the Proposed System.

In other to develop the whole system that will make up of integration of the sub-units mentioned, the following components will be require to build the circuit: NE555 Timer IC, BF495 Transistor, 2PF Ceramic Capacitor, 4.7PF Ceramic Capacitor, 3.3PF Ceramic Capacitor, 47PF Ceramic Capacitor, 30PF Variable/Trimmer Capacitor, 1uF 63V Electrolytic Capacitor, 10K Resistor, 6.8K Resistor, 82K Resistor, 220E Resistor, 5.6K Resistor, 24 AWG Copper Wire, 3 Pin Mini Slide Switch (SPDT), 3mm LED (Green), 2Pin Male Header Connector, 9V Battery Connector, and 9V Battery.

The flowchart for the operation of the whole system is as given in figure 2.

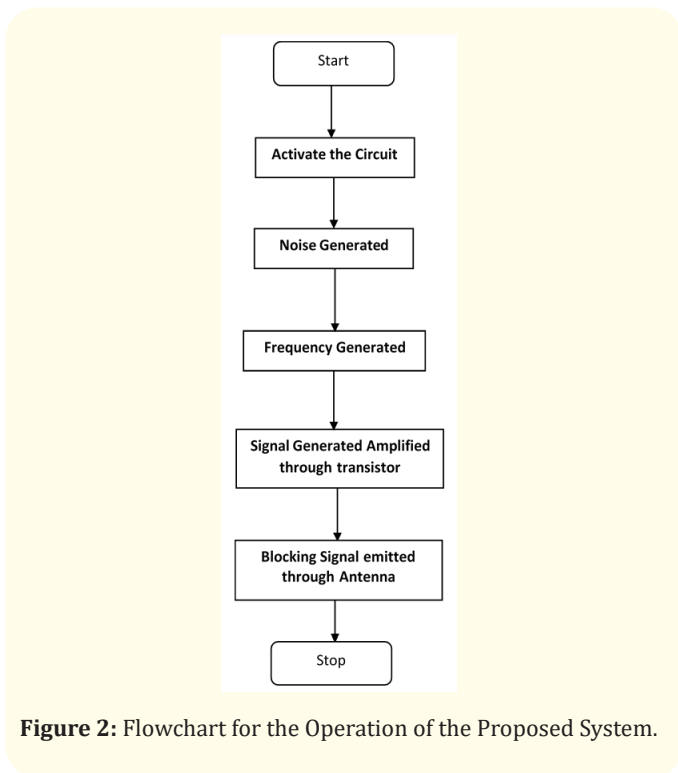


Figure 2: Flowchart for the Operation of the Proposed System.

In other to implement the design,

- First Coil- 4 turns 5 mm of 24 AWG wire was made
- Second Coil- 3 turns 5 mm of 24 AWG wire.
- Third Coil- 15 turns 5mm of 24 AWG wire.

The PCB for the proposed system was implemented with (Printed Circuit Autodesk Eagle, the schematic diagram was done after which we move to board layout and PCB design transferring, Etching, and Drilling. All the components were fixed followed by soldering. Test was done at every stage of the implementation, after soldering we did a test to confirm that two or more pads were not connected via an excessive application of solder (Figure 4). The system battery was connected and the whole system was power on and it was discovered that three cell phones placed at close range within the designed system has no service after about five minutes that the system was ON.

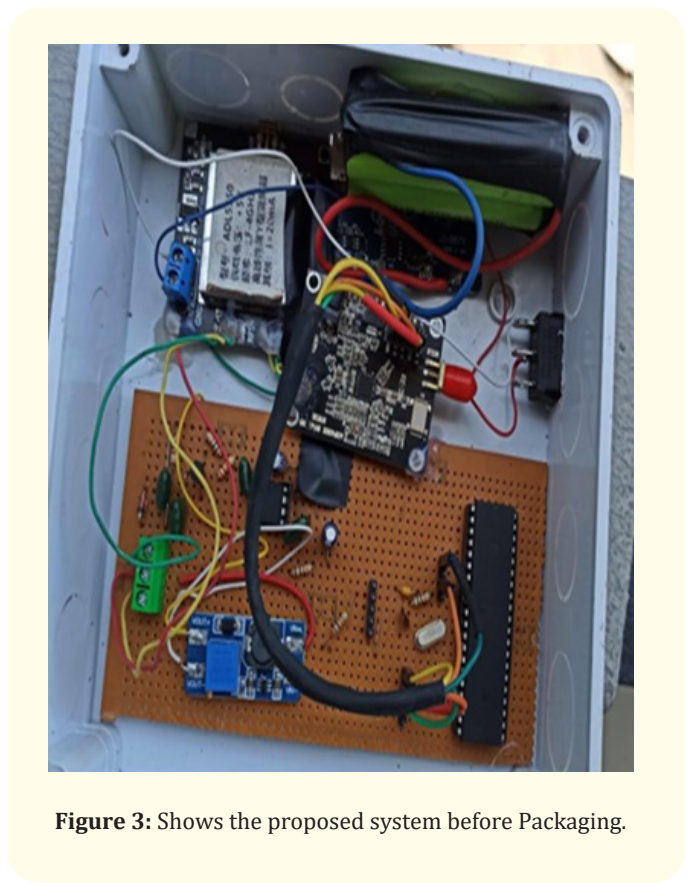


Figure 3: Shows the proposed system before Packaging.



**Figure 4:** Packaged Cell Phone Signal Disable System.

## Conclusion

This work had successfully designed a cell phone signal disable system. The design was implemented by generation of noise signal at a frequency greater compare to the frequency in which the mobile use to communicate with cell tower. The system was intended to be used in an area such as classroom in the schools, court room, church, mosque, meeting room, and library etc., where silence is highly appreciated. The main aim of this work was achieved because the cell phones placed at close proximity to the final product has no service signal after five minutes that the system was powered ON. It was discovered that increase in the value of the resistors and capacitors could result to increase efficiency and power of the cell phone signal disable system.

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