

About Network Jammer

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1 Introduction

A **mobile phone jammer** is a device which deliberately transmits signals on the same radio frequencies as mobile phones, disrupting the communication between the phone and the cell-phone base station, effectively disabling mobile phones within the range of the jammer, preventing them from receiving signals and from transmitting them. Jammers can be used in practically any location, but are found primarily in places where a phone call would be particularly disruptive because silence is expected, such as entertainment venues.



Because they disrupt the operations of legitimate mobile phone services, the use of such blocking devices is *illegal* in many jurisdictions, especially without a licence. When operational, such devices also block access to emergency services.

2 Materials and Methods

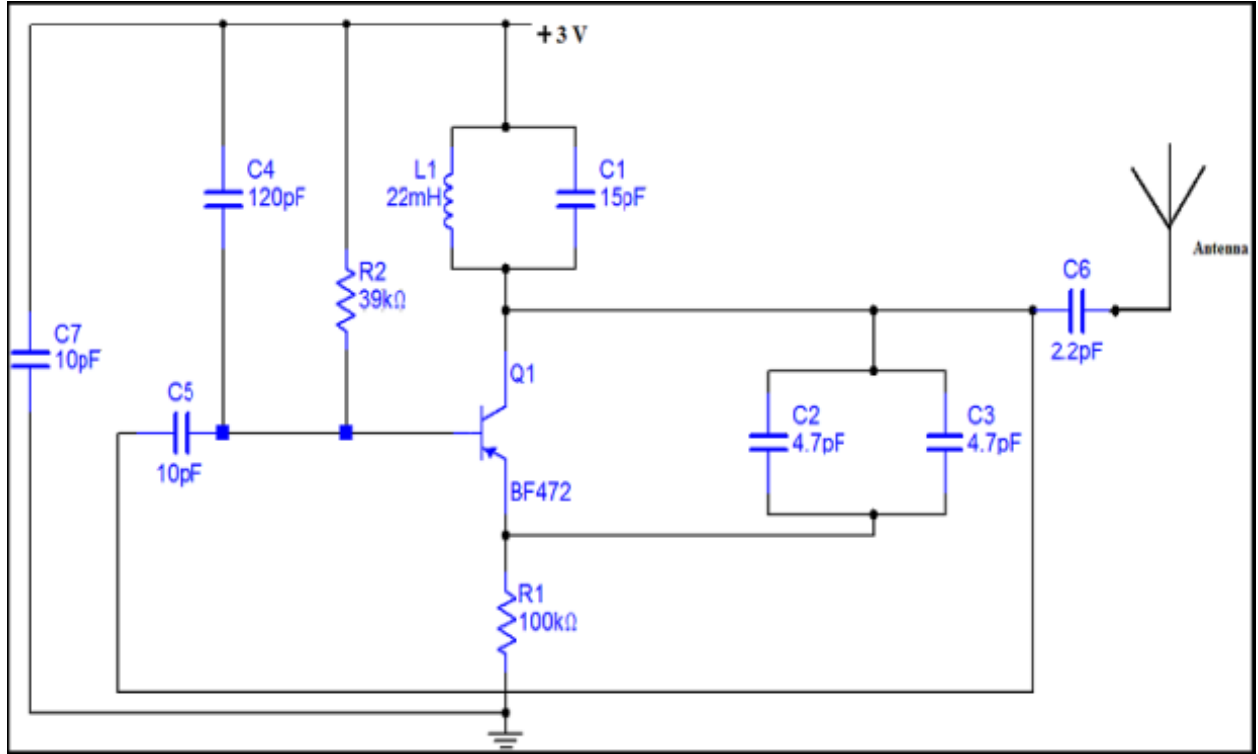
2.1 Materials

Jammer-circuit For any jammer-circuit, there are three main-important-functional parts, and when they are combined together, the output will work as a jammer. There are:

1. RF-amplifier
2. Voltage-controlled-oscillator
3. Tuning-circuit

2.2 Methods

The components used for the jammer, including their- relevant- details are shown in Table 1. In addition, transmitting-antenna is necessary, as most-important-part of any-transmitter. In order to have optima-power-transfer, the antenna-system must be matched to the transmission-system. The main-characteristic of antenna is VSWR (Voltage-Standing-Wave-Ratio). The antenna should have VSWR of 3 or lower, because the return-loss of this antenna is minimal. The antenna used in the project is 4 wave monopole-antenna and



it has 50 Ohm impedance so that the antenna is matched to the transmission system. Also this antenna has low VSWR of 1.7, and a bandwidth of 150MHz around 916 MHz center- frequencies which cover the mobile-jammer-frequency-range. The antenna gain is 2dBi. Frequency Generating Before linking all to the

antenna, power-supply shall not be switched-on at first; also the antenna should not be taking-off when the mainframe is in the working-condition. The jammer shall be installed in the position with good-ventilation, and large-scale-things shall be avoided to ensure to the-shielding-effect. When use the jammer outdoors, preventing water shall be taken into consideration. The GSM mobile-phones-used for testing of the jammer are: Samsung- GT-E1080T; Blackberry-7290; Motorola, C118; Nokia-1100, 1661, 6300; Tecno-T570, T780; TV22i; and iPhonei9+. These-phones were fully-charged so as to avoid the risk of switching-off during the testing-process.

3 Result and Discussion

3.1 Result

The simulated-circuit of mobile-phone-jammer is shown in Figure 4, while Figure 5 illustrates the Breadboard-Assembly of the jammer. The jammer is powered by the 9V-battery D.C. The transistor Q1, capacitors C4 and 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, which removes the DC and allows only the AC signal to be transmitted. 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. The tuned-circuit operation is as follows: 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, which 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 decreased 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 up to 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, so-called modulating signals (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.

3.2 Legal Issues

The review-recorded-below do not claim to be fully-comprehensive-account of every-instance associated with the Legal-Issues related to RF-signals-jamming, however, the assessment does give a fairly-good-picture of the order of magnitude of activities, achievements, and problems encountered, and probably include the most significant ones identified for which information was available at the time this study was carried out. Cell-phone-jammers are illegal in most-countries, except to the military, law-enforcement and certain-governmental-agencies (ACA, 2003), as it is considered a “Property Theft” because a private-service-provider-company has purchased the rights to the radio-spectrum, and jamming the spectrum is a kind of stealing the property the company has purchased. It also represents a “Safety Hazard” because jamming blocks all the calls in the area, not just the illegal or annoying ones. Jamming a signal could block the emergency-calls, where there is a life and death situation. In addition, there could be some innovative misuse or even abuse of the mobile-phone-jamming-technology, for example, there has been an extensive-recent-chitchat on Twitter, that 5-star-hotel-chains installed mobile-phone-jammers to block guests’ cell-phone-usage and force them to use in-room-phones at much-higher-rates (personal experience). According to the ACA’s Declaration Prohibiting mobile-phone-jammers (2003), currently, the most-serious and severe-legal-elimination of mobile-phone-jammers is in Australia, where, for example Section 189 of the Act makes it an offence to operate or supply, or possess for the purposes of operation or supply, a prohibited device, without reasonable excuse. Section 189 also details the penalties that apply if a person is found guilty: if the offender is an individual – imprisonment for two years; or otherwise – 1,500 penalty units (currently 165,000 dollar). The reasons for the prohibition included: mobile-phone-jammers cause deliberate-interference to licensed-services and may cause interference to other-services operating in adjacent-spectrum-bands; All mobile-phones being used within a radius of up to four kilometers from the jamming-device could be ‘jammed’; Concern that radiation-levels of high-powered-devices may result in human-exposure to levels of EMR, that exceed the maximum permitted under Australian-health-exposure-standards. This has implications for public-health and safety, especially in confined areas; Jamming would be likely, among other things, to substantially interfere with, or disrupt or disturb public-mobile-phone-services and have serious-adverse-consequences for public-mobile-phone-users by jeopardizing the quality and extent of carrier-services, preventing access to emergency-services and causing inconvenience to or loss of business for mobile-phone-users. Other services likely to be affected by jammers: Examples of the types of radio-communications services operating in bands near those used by mobile-phones and potentially-affected by mobile-phone-jammers are: trunked-land-mobile-systems; fixed point-to-point links which carry anything from data to multi-channel voice communications; sound-outside-broadcast and studio-to-transmitter links; cordless-telephones; interference with electromagnetic- wave sensitive-devices such as life-support-equipment in hospitals (such as the apnea-monitor) and those in airplanes, and the large-number of devices authorized to operate under ACA- class-licenses (such as garage-door-openers and wireless LANs), emergency organizations (such as poison-information-centres and other-medical-services) or to the normal-phone-numbers for police, fire and ambulance. Mobile-phones are increasingly being used to request emergency-assistance from the police, fire or ambulance services in life-threatening or time-critical situations, for example during 2002-03, (or 1,128,339) of the 3,953,564 genuine-calls to emergency-call-service originated from mobile-phones. There is some-evidence of a potential for mobile-phone-jammers to cause

mobile phones to “lock up” and to remain-so after leaving the jammed-area until the phone is “reset” (e.g. by turning-it-off and on-again). The user may be unaware that this has occurred and of the need to reset the phone (ACA, 2003). Other-countries are dealing with the issue of whether mobile-phone-jamming should be allowed. There have been a number of positions taken by these countries; such as in United Kingdom (UK), Ireland, United States of America (USA), and Europe it is legally-forbidden. Canada: With respect to the use of jamming- devices in connection with federal-security and law-enforcement-functions for national-security-purposes, an alternative-authorization-process is, currently, under review. In Jamaica mobile-phone-jammers are used (with specified-restrictions) in prisons. There is, however, a media-report which suggests that legitimate-services outside the prison boundaries are affected. It has also been reported that universities in Italy have adopted the jamming-technology to prevent overwhelming-cheating, as the students were openly-taking photos of tests with their camera-phones and sending them to classmates (ACA, 2003). From the above it can be ironically-perceived, that cell-phone-jamming-technology is, simply, an illegal-technology, which causes more-problems than it solves. In the local-context, however, Safaricom Company (the largest-mobile-service-provider in Kenya) of Vodafone group and Kenya-Prisons-Services recently announced (after several-pilot-studies) that they will install phone-jamming-equipment in all the major-prisons (CCK, 2014). This was termed as a response to the runaway-crime involving mobile-phones that is perpetuated by prisoners. The strategy of jamming-mobile-phone-signals in prison compounds is a logical-technical-response. By creating islands of non-connectivity in these-jails, it is possible to mitigate the economic and social-risk posed by these incarcerated-criminals. CellAntenna states that jammers provide the-best and most-economical-way to prevent cell- phone use in prisons, require very-little-staff-time, and that the cost of the system depends on a number of factors such as the size and shape of prison, the area to be covered, and incoming tower signal levels (One News, 2007). Cell-phones, especially smart-phones, enable prison inmates’ access internet and social-media-sites as well as receiving and sending short-messages, and videos which poses challenges to public-safety and rehabilitation (Norris, 2016). According to survey on inappropriate use and possession of mobile-phones in prisons of Kenya by Ochola (2015), 34 percent of inmates reported to have owned mobile-phones at one-given-time, 100 percent of the respondents agreed to have used mobile-phones and 78percent have paid to acquire mobile-phone-usage from those inmates owning mobile-phones. On mobile phone usage different-reasons emerged: Criminal acts (swindling the public, threatening potential-witnesses and extortion, Maintaining contacts with family, Private-communication with minimal-oversight by authorities, Facilitation of escapes and Arrangement and co-ordination of contraband supply among others). Statistics from Safaricom indicate that most of the phone-related-fraud-cases originate from prisons; with Kamiti- prison taking the lead with about 1,500 fraudulent SMS and calls during one month only, which translates to 65 percent of the total-incidents during the month. Other than Kamiti the practice is also ripe in other-prisons across the country including, Nakuru, Meru, Kibos and Shimola Tewa. Some-jailbirds arrange for their friends to throw mobile- phones across the wall of the prison after packing them in plastic-bags, which is considered as contraband. In another instance, a prisoner staged a ‘nude protest’ after the jail-authorities examined him following suspicion that he was hiding a mobile SIM card in the private-areas of his-body. Also, the jammers at the Kannur central prison (one of the pilot-projects) were recently switched off after the nearby residents seriously-complained that it was affecting their mobile-communication. No need to say that this delighted the Kannur prisoners.

3.3 Recommendation

The aim of the project which was to build a simple-mobile-phone-jammer is achieved. Jamming-technique is potentially very-useful to disable cell-phone in a particular-range, but it should-not affect the other base station transmission-systems. Mobile-jammer can be used in any-location (subject to particular legal-restrictions), but, practically, in places where a mobile-phone-use would-be, on the whole, harmful, disruptive, and even dangerous, like in prisons. Overall-recommendation is that, further and more deeper-research is needed to produce more-sophisticated and better-jamming-devices, as to not affect the other base station transmission systems.