

Mobile Jammer

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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. It's called denial-of-service attack. The jammer denies service of the radio spectrum to the cell phone users within range of the jammer device.

Keyword: Mobile jammer, working of mobile jammer, components of mobile jammer, devices of mobile jammer.

I INTRODUCTION

Cell phones are everywhere these days. According to the cellular telecommunications and internet association, almost 195 million people in the United States had cell-phone service in October 2005, and cell phones are even more ubiquitous in Europe. It's great to be able to call anyone at anytime. Unfortunately, restaurants, movie theaters, concerts, shopping malls and churches all suffer from the spread of cell phones because not all cell phone users know when to stop talking. While most of us grumble and move on. Some people are actually going to extremes to retaliate. Cell phones are basically handled two way radios. And like any radio the signal can be disrupted.



II MOBILE JAMMER

Mobile jammer is used to prevent mobile phones from receiving or transmitting signals with the base station. Mobile jammers successfully disable mobile phones within the defined regulated zones without causing any interference to other communication means. Mobile jammer can be used in practically any location, but are used in places where a phone call would be particularly disruptive like temples, libraries, hospitals, cinema hall, school and colleges etc.

Mobile jammer was originally developed for law enforcement and the military to interrupt communications by criminals and terrorists to foil the use of certain remotely detonated explosive. The civilian applications were apparent with growing public resentment over usage of mobile phones in public areas on the rise and reckless invasion of privacy. Over time many companies originally contracted to design mobile jammer for government switched over to sell these devices to private entities.

A mobile phone jammer prevents communication with a mobile station or user equipment by transmitting an interference signal at the same frequency of communication between a mobile station and a base transceiver station. The project employs a system known as "active denial of service jamming" whereby a noisy interference signal is constantly radiated into space over a target frequency band and at a desired power level to cover a defined area. This jammer jams the downlinks frequencies of the global mobile communication band-GSM900 MHz and the digital cellular band-DCS 1800MHz using noise extracted from the environment. The jammer works dual-band and jams three well-known carriers of Nigeria (MTN, AIRTEL, and TISALAT). The operational block of the jamming system is divided into two sections: intermediate frequency (IF) section and the radio frequency transmitter module (RFT). The IF section comprises a noise circuit which extracts noise from the environment by the use of a microphone; this noise is mixed with a tuning (ramp) signal which tunes the radio frequency transmitter to cover certain frequencies. The RFT comprises an in-built voltage controlled oscillator, power amplifier and antenna connectors. An antenna radiates the jamming signal to space. Upon activation of the mobile jammer, all mobile phones will indicate "no network, SOS or searching for service" and all phones within the effective radius are silenced. Incoming calls are blocked as if the mobile phone were off. When the mobile jammer is turned off, all mobile phones will automatically re-establish communications and provide full service. A jammer working on man-made (extrinsic) noise was constructed to interfere with mobile phone in place where mobile phone usage is disliked, offensive or forbidden.

III RELEVANT CONCEPTS AND PRINCIPLES

The broadcast control channel (BCCH) is one of the logical channels of the GSM system; it continually broadcasts, on the downlink, information including base station identity, frequency location, and frequency-hopping sequences. This provides cell-specific information including information necessary for the MS to register at

the system. One of the important sub-channel on the BCCH channel includes: frequency correction channel (FCCH) which is used to allow an MS to accurately tune to a BS. It is required for the correct operation of radio system. This allows an MS to accurately tune to a BS. Synchronization channel (SCH), which is used to provide TDMA frame oriented synchronization data to a MS. this is also required for the correct operation of the mobile. Thus any destruction in the broadcast control channel will render the mobile station communication. Communication system technology use a technique known as frequency division duplex (FDD) to serve users with a frequency pair that carries information at the uplink and downlink without interference. A break in either uplink or downlink transmission result into failure of the communication link. This break can be as a result of weak signals due to proximity to the BTS, provided there is no hand over. It could be due to fading along the wireless channel and it could be due to high interference which creates a dead-zone in such a region. The common factors that affect cellular reception include: strength and location of the cellular base station or tower, terrain and topology, weather and climatic conditions, structures, building material and construction methods. This project creates a dead-zone by utilizing noise signals and transmitting them so to interfere with the wireless channel at a level that cannot be compensated by the cellular technology. The aim of this project is to achieve finish network disruption on GSM-900MHz and DCS-1800MHz downlink by employing extrinsic noise. The project is limited to limited to operation at GSM-900MHz and DCS-1800MHz cellular band, with an effective jamming radius of approximately 10 meters.

IV METHODOLOGY

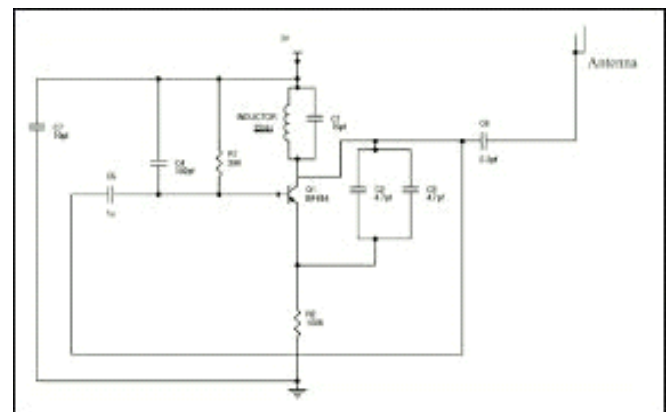
A noise generator is a circuit that produces electrical noise (random, non-deterministic signal). noise generator are used to test signals for measuring noise figure, frequency response, and other parameters, it can also be used for the generation of random numbers. Several noise generation methods include: heated resistors, zener diodes and gas discharge tubes. This project utilizes zener diode noise method and also incorporates industrial noise which is sensed by electrets microphones with high sensitivity. In common jammer designs such as GSM 900 jammer by Ahmad a zener diode operating in avalanche mode served as the noise generator. When zener diodes are operated in reverse bias at a particular voltage level, they go into avalanche mode which results into random current flow and hence a noisy signal. In this project, industrial (man-made) noise is mixed with such noise to create signal with a higher noise signature. This industrial noise is tapped from the environment with the use of high sensitivity microphone at -40+-3dB, placed in front of the jammer for better exposure to noise. With more microphones, a spatial diversity setting would be preferred. Although industrial noise is random and unpredictable, the zener diode avalanche serves the noise requirement when jammer is used in an extremely silent environment. The RF cellular

transmitter module with 0.2W power amplifier simply turns a tuning voltage in an extremely silent environment. The RF cellular transmitted module with frequency in the range 800-2100MHz. This covers the covers the GSM and DCS. A mobile phone might evade jamming due to the following reason: strength and location of the cellular base station or tower, terrain and topology, weather and climatic conditions, structures, building material and construction methods, communication system technology, phone configuration, mobile network type, act of god – jammer fault.

V TEST EQUIPMENT AND PROCEDURE

Digital oscilloscope capable of analyzing signals up to 30MHz was used to measure and analyze output wave forms at the intermediate frequency unit. Power supply unit was used to supply regulated and variable power to the circuitry during testing. A digital multi meter was used to measure resistance, capacitance, current and voltage levels. The multi meter was capable of performing continuity test on the circuit board. A blackberry phone was used as the target mobile station for the jammer. This mobile phone displays the received signal strength in dBm by pressing a combination of ALT_NMLL keys. Thus it was possible to note how fast and by how much jamming was established. Livewire simulator package was used for some simulation tasks each passive component was tested and value verified with respect to circuit diagram and available datasheet, this was done with the aid of the multi meter. Using laboratory breadboard, a prototype circuit was built and then transferred to a permanent circuit Vero-board. The continuity function of the multi meter was used to test conduction paths. The output of each circuit section was tested with the oscilloscope, clean probes were used and the time and voltage divisions were properly set to ensure the required output signal was visible. Noise circuit was tested while the laboratory fan was operational.

VI SIMPLE CIRCUIT DIAGRAM



VII WORKING OF MOBILE JAMMER

Cell phone jammer work in a similar way to radio jammers by sending out the same radio frequencies that cell phone operates on. Doing so creates enough

interference so that a cell cannot connect with a cell phone. Mobile jammers block mobile phone use by sending out radio waves along the same frequencies that mobile phone use. This causes enough interference with the communication between mobile phones and communicating towers to render the phones unusable. Upon activating mobile jammers, all mobile phones will indicate “no network” incoming calls are blocked as if the mobile phone were off. When the mobile jammers are turned off, all mobile phones will automatically re-establish communications and provide full service. Mobile jammer's effect can vary widely based on factors such as proximity to towers, indoors and outdoor setting, presence of buildings and landscape, even temperature and humidity play a role. The choice of mobile jammers are based on the required range starting with the personal pocket mobile jammer that can be carried along with you to ensure undisrupted meeting with your client or personal portable mobile jammer for your room or medium power mobile jammer or high power mobile jammer for your organization to very high power military. A cell phone jammer is a device that blocks transmission or reception of signals, usually by creating some form of interference at the same frequency ranges that cell phones use. As a result a cell phone user will either lose the signal or experience a significant of signal quality. Cell phone jammers have both benign and malicious uses. Police and the military often use them to limit destruct communications during hostage situations, bomb threats or when military action is underway. Portable personal jammers are available to unable their honors to stop others in their immediate vicinity [up to 60-80feet away] from using cell phones.

VIII TYPES OF MOBILE JAMMER

There are two types of cell phone jammers currently available. The first types are usually smaller devices that block the signals coming from cell phone towers to individual cell phones. The frequency blocked is somewhere between 800MHz and1900MHz. Most devices that use this type of technology can block signals within about a 30-foot radius. Cell phones within this range simply show no signal.

The second type of cell phone jammer is usually much larger in size and more powerful. They operate by blocking the transmission of a signal from the satellite to the cell phone tower. Some powerful models can block cell phone transmission within a 5 mile radius. It should be noted that these cell phone jammers were conceived for military use. Once again, It should be noted that operating or even owning a cell phone jammer is illegal in most municipalities and specifically so in the United States. Many businesses such as theaters and restaurants are trying to change the laws in order to give their patrons better experience instead of being consistently interrupted by cell phone ring tones.

IX CONCLUSION

This is mainly intended to prevent the usage of mobile phones in places inside its coverage without interfacing with the communication channels outside its range, thus providing a cheap and reliable method for blocking mobile communication in the required restricted a reasonably. Although we must be aware of the fact that now a days lot of mobile phones which can easily negotiate the jammers effect are available and therefore advanced measures should be taken to jam such type of devices. These jammers include the intelligent jammers which directly communicate with the GSM provider to block the services to the clients in the restricted areas, but we need the support from the providers for this purpose.

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