

## **SNIFFER FOR MOBILE PHONES (MOBILE TRACKING SYSTEM)**

### **Abstract:**

The main scope for this paper is the proposal for the detection for the lost mobile phone. Each and every day over thousands of mobile phone gets misplaced and lost, though an effective way for the blocking of the lost mobile to prevent unwanted user has been done by the manufacturers of the mobile by usage of International Mobile Equipment Identifier (IMEI) has been done but however there has been no development or very little progress in this area to find the misplaced mobile phone. Our proposal has a look that appears little bit costlier while initial setup is done but however the cost is gradually reduced or cut down. Here the same IMEI number that has been used for blocking calls is utilized for the purpose of detection. The scope of this may look limited by various factors like weather, power, natural and artificial disturbances; we feel that this can be a big step that may help the users, service providers, manufacturers in an effective way. The directional antenna is an important device that is to be designed and used as it plays a major role in this project.

**Key Words:** *Bts, Imei, Mtso, Unidirectional Antenna*

### **Conclusion:**

The given paper dealt about the idea of development "Sniffer for detection of lost mobile phones" paves a way by means of which the lost mobile phones can be recovered. The design involved the following:

Design of sniffer base station; design a unidirectional antenna, development of software for tracking. Though this method appears a bit complex involving the design of sniffer but however for large scale detection the overall effective cost of the design and detection scales down. Though there are certain boundary conditions or criteria that have to be qualified for detection of lost mobile like power of mobile should good enough ,the mobile phone should not be in shadow region etc.,but however this method can be improved this method can be improved by using modern technologies and devices.

## **INTRODUCTION:**

One of the most interesting things about a cell phone is that it is really a radio, an extremely sophisticated radio, but a radio nonetheless. The cell phone through the mobile communication system is proved to be an advantageous method of communication in comparison to the wired communication, there is another problem that comes into the picture it is the mobile phones that get lost or gets misplaced. The losses are increasing day by day there has been very little effort that has been done to obtain the lost mobile phone. Our paper 'Sniffer for Mobile Phones' proposes a path for solving this problem. The IMEI number embedded in the mobile phone that has been used for blocking calls it effectively utilized for the purpose of detection.

## **CONCEPT OF CHANNEL MOBILE COMMUNICATION**

The channel in the mobile communication refers to the frequency that is being used for the purpose of communication. Generally there are two types of channel in mobile communication. One of the channels is the traffic channel (physical channel) and the control channel. The physical channel is used for transmission of the voice data and the signaling information. The physical channel carry different message to be sent. These are called as the Logical channel.

## **CONTROL CHANNEL:**

When a MS is switched on the MS searches for the BTS, it scans the entire channel. It scans the list of entire frequency that is allotted to the service provider. It finds a strongest carrier it checks if it is a control channel. It does so by searching a particular logical channel called as Broadcast Control Channel (BCCH). The frequency carrying BCCH contains important information like LA identity, synchronization information and network identity. Without such information the MS cannot work in the network, the information is broadcast at regular intervals leading to Broadcast Control Channel (BCH). When the MS finishes analyzing the information in BCH, it then has the information to work with the network. However, if the MS roams to another cell, it must repeat the process of reading FCCH, SCH and BCH in the new cell. If the mobile subscriber then wishes to make or receive a call, the Common Control Channel (CCCH) must be used.

TRAFFIC CHANNEL: Once the call set-up procedures has been done or completed on the control physical channel, the MS times to traffic physical channel. It uses the traffic Channel (TCH) logical channel.

There are two types of TCH:

The Full rate (TCH): transmits full rate speech (13kbits/sec). A full rate TCH occupies one physical channel.

Half rate (TCH/2): transmits half rate speech (6.5 kbits/sec). Two half rate TCH's can share one physical channel, thus doubling the capacity of the channel.

## **CONCEPT OF IMEI**

The GSM MoU's IMEI (International Mobile Equipment Identity) numbering system is a 15 digit unique code that is used to identify the GSM/DCS/PCS phone to a GSM/DCS/PCS network. When a phone is switched on, this unique IMEI number is transmitted and checked against a database of blacklisted or grey listed phones in the network's EIR (Equipment ID Register). This EIR determines whether the phone can log onto the network to make and receive calls. To know the IMEI number the \*#06# has to be pressed the number will be displayed in the LCD screen; it is a unique to a mobile phone. If the EIR and IMEI numbers match, the networks can do a number of things. They can for example grey list or blacklist a phone:

Grey listing will allow the phone to be used, but it can be tracked to see who has it (Via the SIM info).

Blacklisting bars the phone from being used on any network where there is an EIR match.

## DESIGN FOR THE SNIFFER

The Sniffer for the design for the mobile includes the following important components. Design of a sniffer Base-station. Design of unidirectional antenna. Software that is used for tracking the lost mobile phone's IMEI number.

### THE DESIGN FOR SNIFFER BASE STATION.

The Sniffer is a small Base station; it includes transmitter and receiver circuit. It should operate at a frequency that is much different from the frequency that is being operated by the operator in the current cell and the nearby one's. In addition to this the other main requirement is the design for a highly powerful unidirectional antenna with very low beam width. The design for the base station is an important requirement. Mobile phones as well as the base station has low power transmitter is also transmitting at low power. The transmitter of the "Sniffer" can be a low power transmitter. This helps in the process of reducing the interference of the device with the devices that are in the other cells.

### DESIGN UNIDIRECTIONAL ANTENNA

Though the transceiver in a sniffer plays an important role in the detection of the mobile phone but however it is the directional antenna that has a major role in the design of the transmitter. Hence the proper design of the directional antenna is required. Antenna is device which works at a specified frequencies range for transmitting or receiving the data signal. In general, antennas transmit more power in some directions than in others. Two dimensional diagrams is used to show radiation pattern. Radiation pattern of directional antenna is shown in Fig. 1. In addition to this it is necessary that the transmitter should be a low power transmitter. Gain and directivity are intimately related in antennas. The directivity of an antenna is the statement how the RF energy is focused in one or two directions. Because the amount of RF energy remains the same, but is distributed over less area, the apparent signal strength is higher. This apparent increase in signal strength is the antenna gain. The gain is measured in decibels over either dipole (dBd) or a theoretical construct called an isotropic radiator. The isotropic radiator is a spherical signal source that radiates equally well in all directions. One way to view the omnidirectional pattern is that it is a slice taken horizontally through the three dimensional sphere.

#### Software for the tracking

The software part also plays a major role in the tracking of the lost mobile phone. The mobile phone that is lost has certain IMEI number that is embedded into the chip. The software that is to be designed is designed in such a way that the software has the input as the IMEI number of the lost mobile phone.

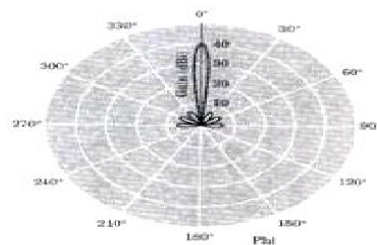


Fig. 1. The Unidirectional Antenna Pattern

## UNI DIRECTIONAL ANTENNA PATTERN

After getting the input of lost mobile phone's IMEI number it checks the com port for getting the information whether the information is available in regard to lost IMEI number in the way the software gets the information from the antenna, other devices about the IMEI number. The programming can be done with C or JAVA with VB and ORACLE at the back end providing the data base information.

## WORKING OF SNIFFER DEVICE

The Sniffer is a transceiver that works in the frequency, which is in the special unused range that is operated by the service provider. The working for the device is as follows. The figure 2 and 3 shows the working of the sniffer; the first one give the normal connection of the lost mobile with the cellular network.

First the IMEI of the lost mobile phone number has to be reported to the service provider, who keeps in track of the record of lost mobile phones. Then the MTSO which keeps in track of all the mobile phones, their IMEI number, their location under which cell under which BTS.

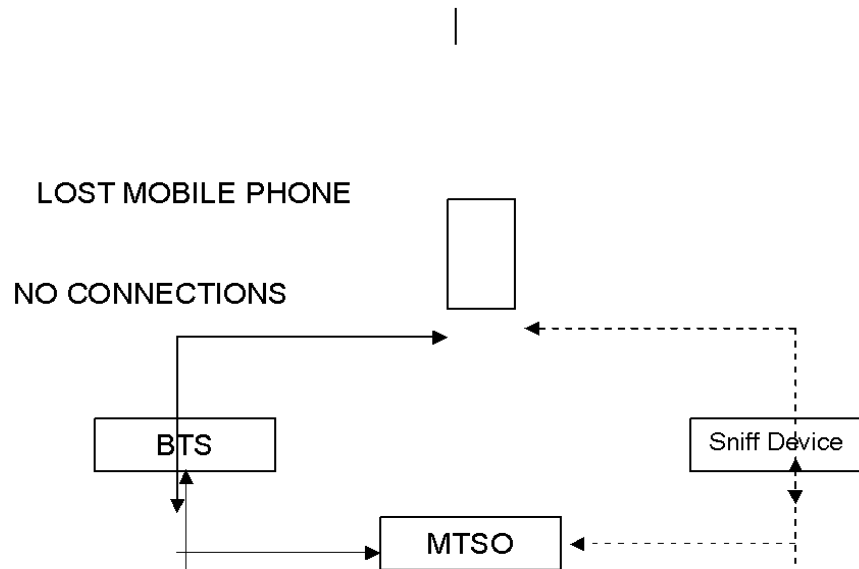


Fig. 2. The Initial connection between the lost mobile phone and Cellular network. The next figure shows the sniffer that gets into work. After the information is provided by the MTSO; the sniffer located in the particular cell gets into action by detecting if the mobile phone is available. The base station disconnects the connection with the lost mobile phone while the connection between the sniffer and the mobile phone is established; the sniffer is operated in a frequency that is different from the frequency from the frequency adopted by the cell and the nearby ones. Hence the interference from the nearby cell can be avoided. The directional antenna is used for the purpose of finding the location of mobile phone.

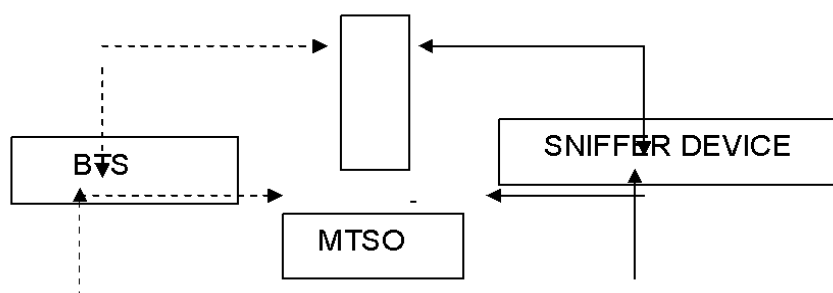
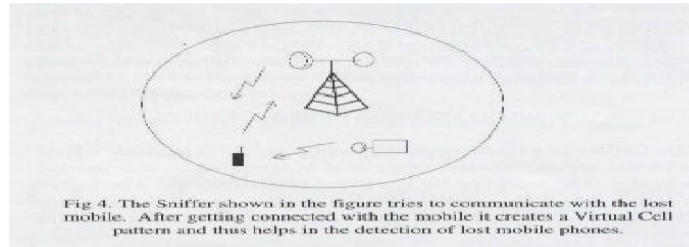


Fig 3: The connection between lost mobile phone and cellular network  
Here the antenna pattern is plotted once the signal of the mobile phone is obtained. The Number of antenna pattern for different position of same mobile phone is used to find the exact location .But however in this method the directional antenna used must be of very small bandwidth.



### **MERITS AND DEMERITS:**

Each and every technology or a device has its own merits and demerits, at times the merits overcome demerits and at others it's vice versa. Though the sniffer device For mobile phones has its own merits in terms for the of using the IMEI number for the detection of lost mobile the frequency that it uses is a high frequency in range of 850-950MHz where there is slight effect of the reflection of the signal from the ground but however the effect is less pronounced and the other demerit here is that even though the directivity of antenna is high or beam width of the antenna is less the distance of propagation should be restricted and the device is handheld and is non automated one. But however this new technique that provides a light for the detection of the lost mobile phones.