Cell-Phone Silencing Alternatives

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Introduction

- The need for silencing cell-phones is increasing rapidly due to a variety of reasons and increased applications

- The objective is to look at different active and passive techniques to silence the cell-phone and compare them.

Switch it off!

Missing a call won't kill you!

from 1st December new legislation comes into force regarding the use of mobile phones while driving.

You may be fined £30 (£1000 if brought to court) if caught using a hand-held mobile phone, or using any mobile phone without due care or attention.

For more information on this subject please visit

www. thinkroadsafety.gov.uk

Application & Market Penetration

- **Applications Classification**
  - acoustic isolation
  - security and privacy
  - health and safety

- **Market Penetration**
  - Religious institutes, concert halls, lecture rooms, libraries, conference rooms, industrial plants.
  - Other markets include the petroleum, healthcare, banking and transportation industries, as well as private individuals.

Active vs. Passive Techniques

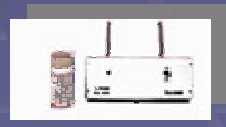
- Active techniques require a source of power to generate a signal required for silencing or controlling the cell-phone.
  - Examples: Jamming / Bluetooth/other systems which communicate with the cell-phone or the service provider.
- Passive techniques achieve the objective without generating local signals. (Shielding).
- Education and etiquettes

Existing Active and Passive Cell-phone Silencing Techniques

1. Jamming
2. Intervention
   A. Through the base station
   B. Through the hand set
3. Detection
4. Shielding

1) Interference (Jamming)

- Jamming is achieved by sending a signal that interferes with the cell-phone. If the jamming signal is relatively strong, communication is not possible with the cell phone.
  - Both incoming calls and outgoing calls are affected.
  - Prevents emergency communications
  - Spills-over outside the enclosed space
  - Increases radiation
  - Could discriminates between carriers
  - Devalues the spectrum



Interference and Regulation

- Interference is illegal in the United States and Canada, and in most other countries of the world.
- Cellular phone signal jammers are illegal in the US, but that doesn't mean they're not used.
- In 1998, Japan's Ministry of Posts and Communications officially restricted the use of jamming for cell phones to "theatres or concert halls where the degree of public nuisance is significant."

Contradiction!

"No person shall…without lawful excuse,
interfere with or obstruct
any radiocommunication."

Radiocommunication Act, 9(1)(b)

The owner of enclosed space
has the right to control unwanted disturbances
within that space

Jamming is Ok provided that…

- Notice is given to inhabitants of and visitors to the enclosed space.
- Provision is made for emergency communications.
- The method used does not significantly increase the radiation within the enclosed space.
- The method used contains the control completely within the enclosed space.
- The device(s) used to implement the control are low power and fully comply with the regulation.

Interference Products

- ***C-Guard*** - uses a high radiation signal to effectively "scramble" a cell phone signal and covers an area about the size of a football field. ($900)
- ***Wave Wall*** - sends out powerful signals on the same frequencies as those used for both incoming and outgoing calls, rendering mobile phones mute. Wave Wall standard version, which has a 7-meters jamming radius, sells for $480.

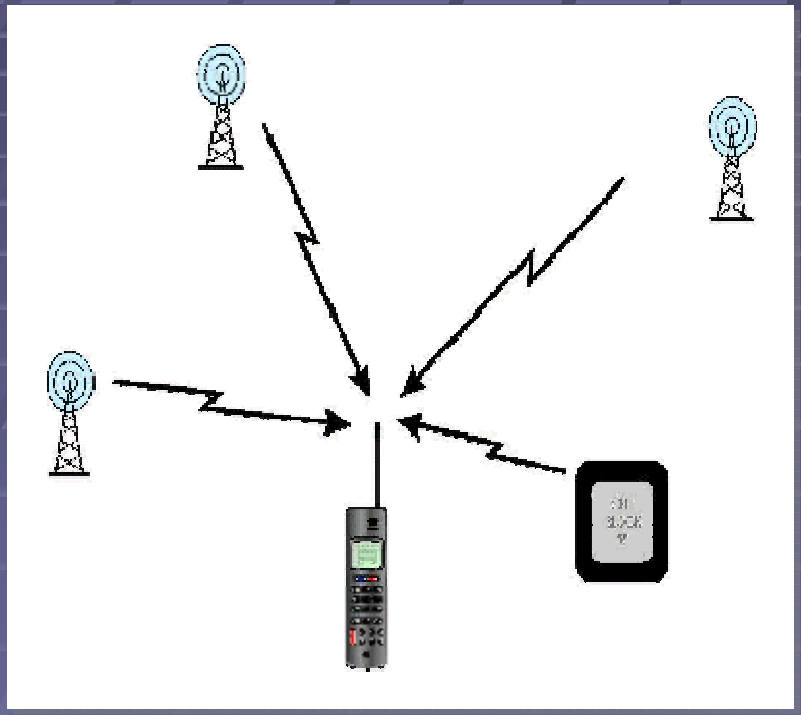
2) Intervention

- Involves direct communication with the mobile phone or the base station.
  A. Communicate with mobile phone -*normally unattended by the cell phone user*- : Q-zone based on Bluetooth technology
  B. Communicate with base station: Cell-Block-R Systems

2.A Intervention Products

- ***Q-Zone*** - interacts with Bluetooth shortwave radio-link systems in public places. The feature is designed to automatically silence cell phone ringing.
- Required hardware change
- Q-Zone does not prevent users from placing outgoing calls or receiving a phone call from a vibration rather than a ringer.

2.B Cell-Block-R Systems

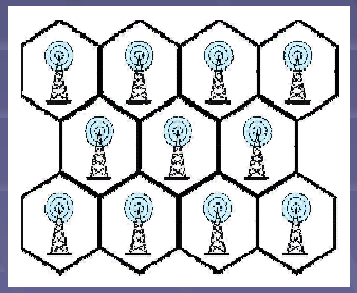


The Cell-Block-R control unit is programmed to respond to the cell phone's ping as if it were a base station.

If the phone is close enough to a Cell-Block-R control unit, the response signal of the Cell-Block-R control unit will be the strongest signal received by the phone.

2.B Intervention Products

- ***Cell-Block-R Systems*** carry out bi-directional communications with cell phones to advise them that they are in a Wireless Restricted Area.
- They are then taken off the standard cell phone network and placed within a private network where they will neither receive calls nor be allowed to call out.
- While on the Cell-Block-R Systems network, normal voice mail activities take place in the phone's home network.
- There is no requirement that the phone manufacturers participate in the program.



Will the telecom operator like the Cell-Block-R Systems?

Airtime = Revenue

- 1st time – call goes to Voice-mail ($)
- 2nd Time – Customer calls Voice Mail ($)
- 3rd time – Customer returns call ($)

3) Detection

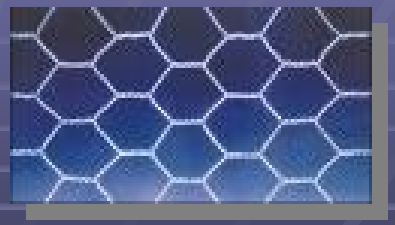
- The presence of the cell-phone / mobile phone is detected and an alarm will be initiated to ask the user to switch of his mobile.
- Though, there is no guarantee that the user will switch of his mobile, it works as a good reminder.
- Products are available with adjustable detection range.

Detection Products

- ***Morse Medical - Model 510 -*** senses operation of cellular telephones and hand-held radios. Once a signal is detected, it provides notification in the form of an audio alarm followed by a voice message.

- ***Zetron – Cell Phone Detector Plus*** detects mobile phone and 2-way radio transmissions. It sounds an alarm followed by a voice message. portable or easily wall-mounted, it can be powered by batteries or an AC adapter and has an adjustable detection range of 2 to 30 meters outward from the unit.

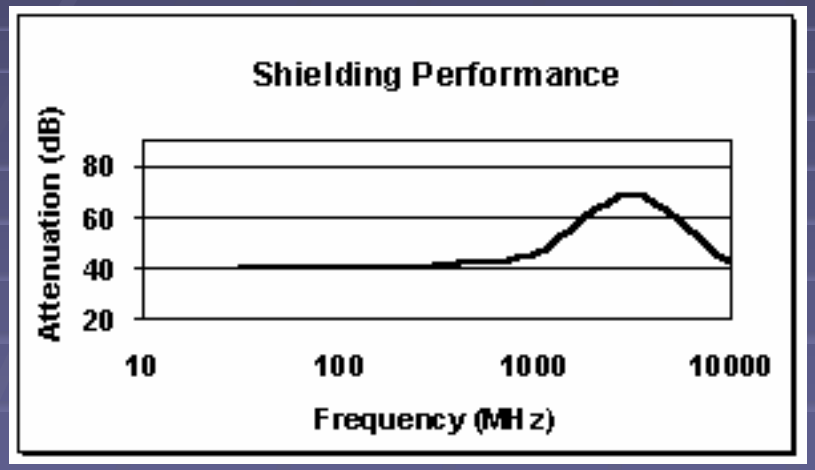
4) Shielding



- If the phone to be controlled is within a certain building, shielding could be the option.
- Using metallic structure like the decorated and covered chicken mesh in addition to a special type of glass for the windows can be an effective blocker.
- Special paint that can effectively reduce the signal from penetrating the walls.
- A team of engineers at Japan's Iwate University to find a blocking method that is inexpensive and easily installed. They have experimented with combining wood and magnetic metal particles to produce paneling that absorbs radio signals.

Some Sheilding Products

DataStop® Conductive Glass



"High Performance RF Shielding For Windows"

- **ISOLUX ™ FILM**
- No need to replace the whole window to get good shielding
- provides certified 99% shielding at cell phone (900 MHz

More Shielding Products

- **BUDGET RF CURTAIN SHIELD**
- ***"High Performance and Low Cost"***
- A light weight, highly reflective mirrorized plastic curtain which is simple to install and provides well over 40 dB (100:1) reduction in common frequency bands

http://www.lessemf.com/plastic.html

Comparing different alternative

- When comparing between the different passive and active mobile silencing techniques one has to consider the following issues:
  - **Interference and Legality**
  - **Health**
  - **Privacy and Security**

Interference and Legality:

- Regulation! Same is true for Saudi Arabia.
- For public it is difficult to find out if a jammer is being used, because it just appears that there's no service.
- It is difficult to figure out if someone is using a jammer, and means that less are getting caught using these jamming devices.
- The debatable question is that as an owner of a building or an enclosed space do not I have the right to limit the unwanted disturbance within that space?

Health

- Signals generated from active elements will add extra concern on the existing health concern.
- Technologies based on detection and shielding are more favorable from this prospective.
- Advantage of using cell-phone blockers in hospitals

Privacy and Security

- Some alternatives do not allow emergency (outgoing calls)
- Require the consent / notify the mobile owner
- Extend beyond the specified band/location/time.
- Enough security to avoid fake zones.

Conclusion

- Finally, cell-phone / mobile phone intervention or control is becoming a need.
- More and more applications are expected.
- The increased abuse is also a dominant factor in pushing this technology.
- Perhaps the best solution will have to be integrated on the cellular system which will have the mean to identify trusted restricted areas from fake ones.
- Other techniques possible (time based for prayer)
- Etiquettes will be part of every solution
- If not today, then tomorrow!

Better today…

Than tomorrow