

## CETEM 2005 Presentation Extended Summary Form

Presenter Information	Contact Information
<b>Presenter Name:</b> <b>Dr. Ali Hussein Muqaibel</b>	<b>Contact Name: Dr. Ali Muqaibel</b>
	<b>Telephone No: 03-8601595</b>
<b>Presenter biography:</b> <ul style="list-style-type: none"> <li>➤ Assistant Professor with Electrical Engineering Department, KFUPM</li> <li>➤ Ph.D. from Virginia Tech</li> <li>➤ Research Interest: UWB, Channel Ch/s, Signal propagation, Channel Coding.</li> <li>➤ About 20 journal and conference publications.</li> <li>➤</li> <li>➤</li> </ul>	<b>Fax No: 03-8603535</b>
	<b>Email Address (Required):</b> <b>muqaibel@kfupm.edu.sa</b>
	<b>Sponsoring Department/Company:</b> <b>King Fahd University of Petroleum and Minerals</b>
<b>Paper/Presentation Title:</b> Cell-Phone Silencing Alternatives	<b>Targeted Audience: (i. e., Management, Engineers, Planners, etc.):</b> <b>Engineers, Management</b>

**Extended Summary: (Do not exceed 1000 words).**

The need for silencing cell-phones is increasing rapidly due to a variety of reasons and increased applications. Applications may be classified into three major categories; namely: **acoustic isolation, security and privacy**, and **health and safety**. Religious institutes, concert halls, lecture rooms, libraries, conference rooms, industrial plants, are some examples where the need to control cell-phones is growing up. Other markets include the petroleum, healthcare, banking and transportation industries, as well as private individuals.

To control the cell-phone ring or calls, **active or passive methods** can be used. Active methods require a source of power to generate a signal required for silencing or controlling the cell-phone. Jamming is an example of active control. Other active control methods include Bluetooth, and other systems which communicate with the cell-phone or the service provider. In passive cell-phone silencing, the objective is achieved without generating local signals. Shielding is used as a passive method to silence the mobile.

In this paper the objective is to look at different active and passive methods to silence the cell-phone and compare them.

**Existing Active and Passive Cell-phone Silencing Techniques:**

**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.

**Intervention:** A cellular phone silencer based on intervention involves direct communication with the mobile user or the base station. The silencer may carry communication with the cell-phone to advise the user that he is in a restricted area. Some cell-phone silencers are based on Bluetooth technology.

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

**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. Other related products include special paint that can effectively reduce the signal from penetrating the walls. Another study is being held by 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.

**Comparing different alternative**

When comparing between the different passive and active mobile silencing techniques one has to consider the following issues:

**1) Interference and Legality:**

Cellular phone signal jammers are illegal in many countries in the world. For example in the United States, according to Radio-communication Act, 9(1)(b); "No person shall...without lawful excuse, interfere with or obstruct any radio-communication.". The fines for a first offense can range as high as \$11,000 for each violation or imprisonment for up to one year, and the device used may also be seized and forfeited to the U.S. government. Cellular phone signal jammers are illegal in the US, but that doesn't mean they're not used. 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. This makes it 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?

**2) 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.

**3) Privacy and Security**

The problem of cell-phone abuse is perceived by public to be an industry Problem while the industry perception that it is a public problem, *i.e.* etiquette. Technique based on intervention can allow outgoing calls including emergency calls. Jamming will most likely cause both ways to be blocked. Intervention can also be used to silence the ring only while allow incoming calls to be delivered.

**Conclusion**

Finally, cell-phone / mobile phone intervention or control is becoming a need. More and more application 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.