The Mobile-Phone Silencers Controversy
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Background

The increase in mobile phone usage has sparked several heated arguments. The main points of contention are:

- Do mobile phones and cell towers emit dangerous levels of electromagnetic radiation?
- Can mobile phones be used for industrial espionage (hidden in jackets or suitcases, possibly without even the owner’s knowledge)?
- Can mobile phone usage etiquette be enforced?

The advent of “mobile phone silencer” has been a brute-force attempt to answer some of these questions. However, the silencers’ existence and usage has raised several, more complicated questions.

Silencers defined

Simply put, the term “mobile phone silencer” is a generic one that describes a class of devices that disrupt mobile phone service. Their purpose is to create a “silent zone,” in which normal cell coverage is interfered with and in which mobile phones cannot operate. This, supposedly, enforces phone etiquette in places where ring tones and phone conversations are unacceptable or forbidden. Some examples are restaurants, theatres and music halls, seminar and meeting rooms, as well as places of worship.

Several types of devices and constructs fall under the generic “silencer” term. The simplest, cheapest and most common one is the “jammer” type. Devices of this type emit electromagnetic signals in the frequency ranges of the public cellular systems and result in causing mobile phones within their operating range to act as if they are in a “no service” area. Their output power varies depending mainly on the size of the silent area they create and the range of frequencies they jam. Normally, their power output is comparable to that of a mobile phone so (additional) health questions are not usually raised (see Appendix II).

A well-known construct that achieves the same result without generating EM radiation is the Faraday cage. Although adding the required metal to cover existing rooms is costly, newer buildings may employ the technique for creating “quiet conference” rooms [1].

More advanced devices create silent zones by intelligently cooperating with cellular providers. They are more expensive and cannot be installed without a lot of administrative overhead - providers will probably yield only to governments and large corporations. Other advanced devices may cooperate with compatible mobile phones and “ask” them to go silent. Standards for this are not yet in place. Finally, even more complicated devices may pose as a cellular base station and confuse mobile devices within their range (their advantage is that they are compatible with legacy phones and there is no need for a provider’s cooperation [1]).

These more advanced devices attempt to address the issue of how to allow for emergency incoming and outgoing calls. Although attractive ideas do exist, the lack of standards drive most interested parties to buy the simpler and cheaper jammer-type of devices.
Here lies the controversy. Although jammers are being used by law enforcement agencies, their free usage is restricted in countries that value the electromagnetic spectrum. Both international and national law protects EM frequencies from unauthorized interference.

**Debate**

Given the fact that the EM spectrum is protected and cellular operators pay dearly to acquire the required licenses, it is the government’s duty to protect the value of this transaction. Using a jammer is the wireless equivalent of cutting a public wired phone line. Also, a user cannot normally differentiate between a jamming signal and a simple cellular coverage problem. To demonstrate other potential legal nightmares, jammer opponents use two fictional examples.

The first fictional example is the case of a doctor being entertained in a restaurant that has a secret jammer installed. An emergency call to the doctor is blocked by the jammer. The patient dies. The legal dispute which could follow would be a lawyer’s dream: it would involve the doctor, the mobile phone supplier, the cellular operator, the restaurant owners, the jammer manufacturer and, of course, the government.

The second fictional example involves a user needing to make a genuine outgoing emergency call. If a jammer blocks it, the consequences may range from the loss of valuable time to the loss of human life.

The rival side either raises the need for privacy - as exemplified by the need for quiet and secure conference rooms - or the need for “simple peace and quiet.” Although a case can be made for large corporations, the military and governments, the case for those asking “simple peace and quiet” is not strong enough, especially since alternative countermeasures exist.

**Additional usage implications and jammer alternatives**

Jamming signals do not realistically affect only a well-defined area but also spill over. Even if the denial-of-service-silent-zone is clearly marked, jamming will probably affect other mobiles outside the zone that are close enough. Also, jammers that only affect a subset of the cellular frequencies may create unfair discrimination against the provider using these frequencies (or, at the very least, cause many angry customer support calls [1]). If jammers proliferate nothing can stop a hotel owner, for example, from installing one in secret and force the customers to make calls through the hotel system – generating more revenue. Although no hard evidence exists, jammer usage is probably increasing.

The alternative which most mobile phone companies support is public education. Since mobile phones are a relatively new trend, etiquette for their use has not yet been developed in most countries. A polite sign to turn off all mobiles or switch them to silent mode is a far simpler solution to creating silent zones. Individuals may choose whether or not they wish to enter such zones. Silent alerting, messaging, low-voiced phone conversations and common sense can further help to solve the rest of the social issues.

Finally, another alternative built on new standards and technology would be to use other EM signals to warn mobile devices upon entering a quiet zone. Compatible devices would lower their ring volume or switch to silent/vibrate mode even if their absent-minded owner forgets to do just that. Of course, the aforementioned absent-minded owner should have enabled this “clever” feature voluntarily. A company [2] is promoting a product that does just that using Bluetooth signals. The mobile phone hardware and firmware should, of course, be compatible. Additionally, simpler mobile detectors do exist: these devices just monitor the frequencies and can detect cellular signals coming from a mobile. They can then alert with a flashing light or voice messages [3] and instruct the user to silence the phone.
Conclusion

The United States, United Kingdom, Australia, France and Japan are either completely against jammer usage or are prepared to allow for more intelligent disablers [1], always under strict control and a licensing scheme. Standards, laws and regulations are always in a state of flux, though. Canada had a 90-day public debate (starting March 12, 2001) and the majority of the views expressed were against jammer usage [4]. Proper legislation regarding limited, authorized usage of intelligent silencers could take years. Meanwhile, jammer deployment has too many repercussions and cannot be considered a viable solution to the problem of enforcing quiet zones.

Appendix I - The Greek Parliament case

It has been noted in recent news (January 9, 2002) that the Greek Parliament has started using a silencer system. The Indian Parliament has made similar arrangements (March 8, 2001).

The Greek National Telecommunications and Post Commission is the national authority that regulates the telecommunications market [5]. Greek Parliament Act 2867/2000 [6] (the “Telecommunications” act) has strengthened the Commission’s regulatory role. Article 7 paragraph 5 of the act states that the Telecommunication Commission is responsible for protecting radiofrequencies from jamming. Therefore, under current law, the Telecommunication Commission has the obligation to intervene whenever licensed radiofrequencies are interfered with, wherever this may occur.

Appendix II - Jammer manufacturers and specifications

With a price range from $150 to several thousands dollars depending on the coverage area, frequency range and additional features, we selected four jammer products from four different companies. A casual Internet search will reveal many more, but it will be almost impossible to find one from a well-known company. The advertised power outputs are shown in the last column.

<table>
<thead>
<tr>
<th>Company</th>
<th>Country</th>
<th>Website</th>
<th>Product</th>
<th>Power output</th>
</tr>
</thead>
<tbody>
<tr>
<td>Netline Communications</td>
<td>Israel</td>
<td><a href="http://www.cguard.com">www.cguard.com</a></td>
<td>C-Guard Cellular Firewall</td>
<td>0.5W - 1W (or 10W - 30W for advanced unit)</td>
</tr>
<tr>
<td>Hi-tech Electronics</td>
<td>Singapore</td>
<td><a href="http://www.hitech.com.sg">www.hitech.com.sg</a></td>
<td>GSM Silencer</td>
<td>1W – 2W</td>
</tr>
<tr>
<td>Starport</td>
<td>UK</td>
<td><a href="http://www.starportuk.com">www.starportuk.com</a></td>
<td>GSM Blocker</td>
<td>0.8W – 1.2W</td>
</tr>
<tr>
<td>Image Sensing Systems</td>
<td>USA</td>
<td><a href="http://www.mobileblocker.com">www.mobileblocker.com</a></td>
<td>Mobile Blocker</td>
<td>0.1W (20dBm)</td>
</tr>
</tbody>
</table>

For comparison, the maximum power output from a mobile phone is between 0.1 and 0.6W [7]. Also, there exist safety guidelines for mobile phone base station antennas [8] which are typically expressed in “plane wave power density” (measured in mW/cm²). The following figure (taken from [8]) shows that base stations for existing systems (GSM, CDMA, UMTS etc.) emit power levels far below the accepted standards and can therefore be considered safe.
### Appendix III – World-wide web references


2. BlueLinx, Inc. (Using Bluetooth to silence mobiles) at [http://www.bluelinx.com](http://www.bluelinx.com)


(Referenced by the World Health Organization’s Electromagnetic Fields Project at [http://www.who.int/peh-emf/faq/qanda_main.htm](http://www.who.int/peh-emf/faq/qanda_main.htm))

<table>
<thead>
<tr>
<th>Power Density (mW/cm²)</th>
<th>Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>Clear Hazards</td>
</tr>
<tr>
<td>40</td>
<td>Reproducible Effects</td>
</tr>
<tr>
<td>4</td>
<td>Unconfirmed Reports of Effects</td>
</tr>
<tr>
<td>1</td>
<td>FCC Public Exposure Standard (2000 MHz)</td>
</tr>
<tr>
<td>0.5</td>
<td>FCC Public Exposure Standard (900 MHz)</td>
</tr>
<tr>
<td>0.01</td>
<td>Maximum Near a Cell Phone Tower</td>
</tr>
<tr>
<td>0.0002</td>
<td>Typical Near a Modern Phone Tower</td>
</tr>
</tbody>
</table>

*2000, J. Moulder*