

**Before the
Federal Communications Commission
Washington, D.C. 20554**

In the Matter of)	
)	
Section 68.4(a) of the Commission's Rules)	WT Docket No. 01-309
Governing Hearing Aid-Compatible Telephone)	RM-8658
)	
)	

Reply Comments of Motorola

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Motorola Reply Comments

Motorola Inc. provides these brief reply comments in the above captioned proceeding. Motorola supports all of the points made in the comments previously filed by the Telecommunications Industry Association (TIA), and also the general positions taken by Sprint and CTIA.

While there is no need to repeat the many good points made in those comments, the following points deserve emphasis and some further elaboration.

- I. There has been no showing in the comments filed that lifting the HAC Act exemption for mobile phones would be productive or appropriate or that the statutory criteria for lifting the exemption have been met.

As many have pointed out, the Hearing Aid Compatibility Act (the "HAC Act") required that phones be capable of effective inductive coupling with hearing aids that are designed to be compatible with those phones by including a telecoil (t-coil). The Federal Communications Commission applied the Act by adopting a phone standard directed solely at use with hearing aids that have t-coils with certain standard characteristics. The legislative record shows that this was Congress's primary goal. Despite the exemption of mobile phones from this requirement, and the fact that there is no coupling standard for wireless phones, many mobile phones today have this capability. In fact, virtually all Motorola wireless phones introduced over the past year have t-coil coupling capability. Thus, the HAC Act requirement, as it is defined is already technically being met by many wireless phones, and removing the exemption would not provide much benefit.

Furthermore, the HAC Act does not address the problem raised by petitioners. Not only do 80 percent of hearing aid users not have t-coils in their hearing aids, but even those who do have t-coils often have a hard time using a mobile phone because their hearing aids unintentionally pick up RF (radio frequency) interference from normally functioning mobile phones. In fact, some hearing aids pick up interference from mobile phones of others in the same room, as well as from fluorescent lights, computer screens, and other sources. Lifting the HAC Act exemption at this point would not do anything to solve this problem, because the HAC Act does not address interference, and the only standard for phone compatibility with hearing aids under the HAC Act does not address interference. Even if the HAC Act were expanded to cover RF interference, which was not the law's intent, simply ordering phones to become usable with all hearing aids would be to ask the impossible, as TIA and others have clearly shown. The only way to ensure that interference with an unimproved hearing aid doesn't occur is to turn the phone off.

Even if the HAC Act did apply to RF interference, the HAC Act exemption-lifting criteria are not met, because designing phones to absolutely prevent RF interference is not "technologically feasible." It follows that lifting the exemption would not avoid any adverse effect on hearing-impaired individuals. And, because the only way to ensure that interference doesn't occur would be to avoid transmitting, any such a requirement would make any compliant phones unmarketable. Thus, there would be no public benefit to lifting the exemption.

- II. While the HAC Act does not cover RF interference, the Commission could adopt an approach like that used in the HAC Act to address the RF interference problem.

While the nature of the RF interference problem is somewhat different than the problem addressed by the HAC Act, a similar approach could work to solve it. In creating the HAC Act, Congress recognized that the correct approach was to first identify certain capabilities that hearing aids would have to incorporate for technological interoperability with phones. In the case of the HAC Act, that capability was the t-coil, whose characteristics allowed for inductive coupling with phones. As long as that capability was included in the hearing aid, a phone's functions could ensure that it would operate with hearing aids that had such a capability.

The first step in applying such an approach to RF interference would be to establish performance requirements for hearing aids, that allow interoperability with mobile phones, such as the Class 2 immunity standard adopted in Australia. Hearing aids that meet this standard would be, in HAC parlance, "hearing aids that are designed to be compatible with" mobile phones.

The Commission should work with the Food and Drug Administration ("FDA") in establishing this standard. Once this hearing aid standard is established, the operating parameters for cell phones would be more clear. Phones designed to operate within those parameters would generally be usable by persons with hearing aids that meet the standard. This has been the very successful experience in Australia, and there is no reason to believe it would not work here.

As has been stated by TIA, the industry stands ready to help in this first step. The industry can assist by providing assistance to any hearing aid manufacturer on design for immunity, by providing information on sources for inexpensive components, and by providing whatever other assistance would be helpful. Because this is the essential step in achieving the goal of having all persons with hearing aids

become satisfied mobile phone customers, the industry has a strong interest in seeing it succeed.

The claim by several commenting parties that certain CDMA phones have been found to result with less interference in some hearing aids has been raised as a basis for arguing that the interference problem could be solved by altering cell phones. In fact, it shows the opposite. As the experience in Australia and elsewhere has demonstrated, CDMA phones generally result in less hearing aid interference than some other technologies. The reason for this, clearly set forth in Sprint's comments, is that many hearing aids are more immune to CDMA because the standard CDMA technology uses no periodic interruption of the carrier wave, although it can have a broad frequency spectrum. Thus, because hearing aids are designed primarily to pick up the audible frequency band, it is more likely they will be relatively immune to CDMA signals. (By contrast, TDMA technologies, such as the GSM technology, have strong steady pulses at a rate that is within the audible frequency band.) For this reason, today many hearing aids are more likely to be somewhat immune to CDMA signals than to TDMA signals.

Thus, the fact that some CDMA phones appear to be usable with several hearing aids does not show that all cell phones could achieve this. What this does show is that where hearing aids have a design that makes them relatively immune to certain RF signals, the hearing aids can be used more successfully with those mobile phones. All that is needed is to make them immune to other signals; that is design them with additional immunity to eliminate RF interference from TDMA and GSM phones. As has been pointed out in the comments, the techniques do exist to eliminate such RF energy from interfering with electronic circuits. This can be done inexpensively and it is done successfully in every CDMA and GSM or other TDMA

phone (to prevent interference with its own transmitter). Each of these phones must also receive a clear interference-free sound for the person talking on the mobile phone, despite being in the same housing as the transmitter's pulsed signal. Such immunity to interference is also being successfully added to hearing aids in Australia today as the manufacturers move their designs from Class 1 to Class 2 immunity.

Finally, Motorola's experience is that the same mobile phones that are praised by some hearing aid users as very usable are condemned by others as a problem. There can be no assurance that any mobile phone will not cause interference with a hearing aid that is poorly immunized, because it is not possible to eliminate the RF signal generated by the phone. As noted earlier, some hearing aids even generate interference from mobile phones used by bystanders. There would be no way to ensure no interference in such a hearing aid other than to turn the mobile phone off.

- III. Any approach that the Commission adopts to address mobile phone use by persons with hearing loss should accept multiple different solutions because this will best meet the different needs of different users.

It is crucial to both users with hearing loss and the industry that the Commission not lock into a single particular solution to address the problem of mobile phone use by persons with a hearing loss. Many, probably most, persons with hearing loss do not even use a hearing aid. Many who do use a hearing aid may prefer a hands-free solution, following the overall trend in the mobile phone market. Some hearing aid users have t-coils, but many more do not. Some hearing disabled users may prefer translation of voice to type on the screen of the phone, or some other feature not even imagined today.

In order to allow the flexibility needed to meet these many different situations and preferences, the Commission should not force all mobile phones to approach the issue in the same way. Therefore, if the Commission determines to use the HAC Act as a basis for further action on this problem, it should give a broad reading to the term "internal means" to encompass any mobile phone configuration used by a substantial number of users, including ear pieces or head sets. After all, even a traditional land-line phone has two parts, connected by a wire, both parts of which are considered internal under the Act. Cordless phones likewise provide a separate piece held to the ear. To read the "internal means" requirement of the HAC Act in an overly narrow way would result in prohibiting many effective and user desirable solutions. The Commission should embrace multiple solutions to meet the multiple demands and preferences.

IV. The Commission should meet with Australia officials to better understand the successful Australian program.

In Australia, there has been extensive government sponsored research into the interference problem, there have been successful steps implemented to solve the problem, and there is therefore extensive available knowledge and experience that would be invaluable to the Commission, to the FDA, and to others in moving quickly and successfully to solve this problem in the U.S. We urge the Commission to meet with these experienced Australian government agencies, and to invite the FDA to participate. Motorola can provide names of contacts if desired.

Respectfully Submitted,

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