**Contribution of G3ict – The Global Initiative for Inclusive Information and Communications Technologies to the
Working Party 5D (WP 5D) - IMT Systems**

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Anticipating the dangers of unprotected spectrum to Persons with Disabilities

# Background

This contribution follows exchanges among experts from wireless industry, assistive technologies companies, governments and persons with disabilities organisations held at the 2015 M-Enabling summit in Washington DC on the 1st and 2nd of June followed by an international meeting hosted by the FCC on the 3rd of June.

There were many presentations on assistive technology, systems and software to assist persons with disabilities. Also discussed were the barriers that affect and exclude persons with disabilities that also impact the use of assistive technology and in particular Assistive Listening Devices (ALD). The use of assistive mobile phone apps was prominent in a number of discussions as well.

There are many ALDs as well as Short Range Devices (SRDs) including insulin pumps, other Medical Body Networks, and Bluetooth enabled devices, including ZigBee used for the smart home and for the Internet of Things (IoT). Mission critical wireless assistive solutions and remote services for seniors, deaf persons, blind persons, or persons with cognitive disabilities are poised to expand dramatically as demonstrated during the Summit, benefiting a population of more than one billion persons worldwide as per WHO and World Bank latest estimates[[1]](#footnote-1). For persons with hearing disabilities the most important ALDs are hearing aids and cochlear implants which are already widely used around the world.

# The problem

Using hearing aids as one ALD example, babies as young as six weeks are fitted with radio assisted hearing aids in order that they can hear and communicate with their mothers. This has been shown to increase early cognitive development. Children can later successfully interact with their teachers and classmates and in many cases learn speech through using ALDs. Studies have shown that ALD technology enables hearing impaired children to become fully functioning adults improving their life chances and social skills of being able to interact with society. It also important for survival in all kinds of life circumstances especially in emergency situations.

These devices globally use and share this limited bandwidth in the 2.4-2,483GHz band. The problem is the loss of service by many ALDs and SRDs (as described above) using the 2.4-2,483 GHz band width as physically adjacent mobile phone transmits on the 2.3-2.4 GHz band. There is evidence though not yet fully tested, that there is negative impact caused by the sandwich effect of mobile phones using the spectrum above and below the 2.4-2.483GHz band. When both 2.3 and 2,5GHz bands are simultaneously used in close proximity to a hearing aid user or the IoT systems in smart houses, there is the danger of loss of the radio link. This of course causes interference or loss of service.

The 2.4-2.483GHz band is the only world wide band available for such devices, but it is not protected. The current ITU Radio Regulations do not provide any protection for ALD or SRD devices. The reality is that hundreds of millions of SRDs including ALDs currently inhabit the 2.4-2,483 GHz band and a large number of these greatly improve the life chances of those with a variety of disabilities. If they are impacted negatively, it will cause great hardship.

# Current lack of recognition of the issue may lead to major negative impact on a large population

We understand that OFCOM UK have carried out compatibility testing with a range of SRDs in the 2.4-2.483 band and concludes:

• *1.17* *As with Wi-Fi, we believe that no further intervention in the market is necessary because the likely impact is very small and there are appropriate precautions that can be taken.*

• *8.36* *Therefore, we believe the likelihood of impacts to ALDs is very low and there are some mitigations to avoid this if necessary (such as small changes in position relative to the LTE handset). As a result, we do not believe there are any reasons to change to our release proposals for the 2.3 GHz band.*

However within the four Ofcom reports, it is shown that proximity to a mobile phone transmitting on the 2.3GHz will cause interference to an ALD or similar system. How is it possible to justify stating that any interference to a person with disabilities is acceptable when in many situations, malfunctioning of an assistive technology can translate into major life disrupting or threatening situations?

The report also states that, *a suggested mitigation of small changes in position relative to the LTE handset* *is the solution*. This is making the assumption that the ALD user (the person with disabilities) is in the same room as the handset and understands where the interference is coming from. The evidence given is that the interference has been shown to impact ALDs up to 5 meters. Will a mother or young child understand where the problem is coming from? Or in the case of a crowded train how does the ALD user identify the person creating problem with his phone and confront that user? Or unable to hear an upcoming car on the street? Unfortunately the majority of members of the public are not radio engineers.

# Trends in the market place

The problem will get worse as people increase the number of devices they personally use. Even the remote mouse uses this spectrum and the more phones using the 2.3GHz that are sold increase the potential for greater interference. And tomorrow, the growth of wearable devices for mission critical wireless services such as those used to monitor the health and safety of seniors or to provide real time remote image recognition for the blind will compound the criticality of those issues.

It is important for the general population to know that this problem will also affect non 2.3 GHz mobile phones using Bluetooth and other similar radio links, in addition to affecting ALDs for persons with disabilities. How can 2.3GHz phones be clearly identified by the public who uses ALDs or other medical devices, so that they refrain from purchasing them?

# Conclusion and request to Working Party 5-D

This contribution of G3ict is a request to the Working Party to prevent and rectify this problem:

1. Can ITU-R Study Group 5D propose methods to prevent interference to ALD and SRD devices that use a range of protocols including Bluetooth, Bluetooth low energy, Zigbee and 802.11 ?

2. Is it possible to create protected spectrum?

3. Is it possible to elevate the classification of ALDs and medical devices and include devices using Bluetooth critical economically to industry?

4. Can the mobile industry help us solve this problem?

To quote some statistics from the 5th Quadrant Analytics report called *The Global Economics of Disability 2013*.

• 1.3 billion Persons with Disabilities worldwide

• 2.2 Billion people “emotionally attached” to them, i.e. close family and friends

• 1 trillion dollars of disposable income in the U. S. between PWD and those emotionally attached

• 8 trillion dollars disposable income worldwide between PWD and those emotionally attached

1. <http://www.who.int/disabilities/world_report/2011/en/> [↑](#footnote-ref-1)