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From : David Clark Company Incorporated
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Subject: Comments on TRAI Consultation Paper **No. 9/2011**

"Allocation of Spectrum Resources for Residential and Enterprise Intra-telecommunication Requirements/ Cordless Telecommunication Systems (CTS)".

Company Presentation

David Clark Company is a Small Business with approximately 350 employees in Worcester, MA, USA, which manufacturers products that protect people and saves lives. Among our core competencies is the manufacture of communication systems which work in conjunction with noise-attenuating headsets, both wired and wireless, for use in high-noise environments such as airline ground support, various military applications, fire/rescue, marine/workboat, railroad, and heavy construction/industry. Attached is a sample data sheet on a typical DCCI product with DECT wireless content. Insight into major sectors served with our DECT systems can be reviewed on our website at the following link:

http://www.davidclark.com/Wireless/

Issues for Consultation

3.1 Whether the current allocation of spectrum for CTS is sufficient to meet the requirements? If not, then how to meet the demand of cordless telephony spectrum requirements?

Answer: The current allocated spectrum for CTS in the ISM (WiFi) band and the 1880-1900Mhz band for digital CTS as indicated under paragraph 2. of the Consultation Paper, is sufficient for existing needs. If required in the future the 1910-1920Mhz band could also be considered for digital CTS applications. However, while the ISM (WiFi) band, which is suitable for data but not very appropriate for voice, is de-licensed, the 1880-1900Mhz band which is most suitable for voice is a licensed band. This has only discouraged users from taking advantage of the current available digital CTS technologies and to the best of our information no license requests have been made to WPC. Private space digital CTS technology for residential and enterprise use cannot work in a licensed regime as they are purchased off the shelf & no frequency planning is required All over the world state of the art digital CTS works in a de-licensed 1880-1900Mhz band or 1910-1920Mhz band.

3.2 In view of the availability of cellular mobile services in the country and possibility of Fixed Mobile Convergence (FMC), is there any need to have DECT Phones?

Answer: Yes, there is a need for DECT phones None of these technologies can provide efficient solution for private space . DECT systems for residential and SOHO applications provide single cell systems covering the whole living area including the basement (cellar) etc. Furthermore, DECT systems can be used with no interference and full security for multiple co-located installations with no radio planning or licensing requirements. Cellular pico cell systems cannot provide this service. Furthermore they add to the revenue outflow for intercom calls.

DECT enterprise systems provide on-premises local mobility and *full coverage* through seamless handover between pico-cell base stations. The services offered are the wireless PBX telephony service and different low and medium rate data services for supervision, control, maintenance and alarms. The DECT local mobility pico-cell system is preferred as the cellular service is unable to provide the required quality, coverage, services or required integration with local key administrative and production systems. DECT can provide local messaging/broadcast and control functions for private space equipment. This is not possible in the case of cellular pico-cell services. Revenue outflow, licensing and frequency planning are other issues related to cellular pico cells.

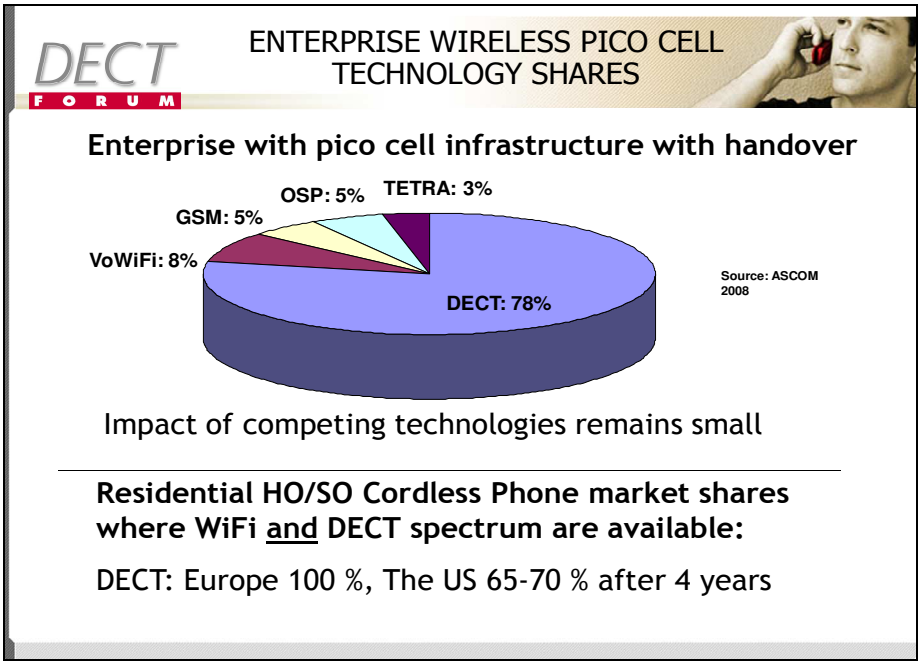
3.3 Is there any requirement of allocating spectrum for digital CTS, in view of similar solutions being available in already de-licensed band2.4 & 5.8 GHz?

Answer: There is a basic difference between coexistence properties on a digital CTS band and on an ISM band (Wi-Fi).

The 20 MHz spectrum designated for digital CTS in other countries requires that equipment using this spectrum have to comply to specific dynamic channel selection procedures, power levels etc. It provides for maintaining high spectrum efficiency and maintaining high quality radio links (e.g. speech and video) in an environment of a multitude of uncoordinated system installations. There is no interference between co-located systems and total spectrum is very efficiently shared between all the co-located systems.

The ISM bands (2,4 and 5 GHz)do not have any such feature. Opposite to a digital CTS spectrum having rules for uncoordinated compatible installations, the ISM bands allows for uncoordinated usage of a variety of incompatible communication devices and also domestic (microwave ovens), industrial, scientific and medical devices. Therefore maintenance of a high quality of service will not be guaranteed when different ISM band devices are used in the same local area. This applies especially to voice and video services, but is less critical for best effort packet data services, where non-time-critical retransmissions are applied when expected collisions occur.

The above intrinsic differences between digital CTS and Wi-Fi CTS is clearly demonstrated in countries where both are allowed, as in Europe and the US. In Europe where DECT has been established for many years, there is literally no market for Wi-Fi CTS. In the US DECT has quickly become the dominant CTS at the expense of earlier domination of ISM band digital phones. Wi-Fi has not been able to compete with digital CTS regarding mission critical voice and real time medium rate data applications for enterprises. (The diagram below shows the market share)



It is obvious that India needs a 1880-1900Mhz license exempt protected TDD spectrum (defined by a coexistence etiquette) to provide state of the art residential and enterprise mission critical voice and medium rate data services.(Table 1.7 of TRAI paper substantiates that DECT is prevalent in all the major countries as now it is even adopted in JAPAN)

3.4 Whether de-licensing of the spectrum for digital CTS applications will be the right path?

Answer: Yes it is absolutely essential in the best interest of the general public. CTS has to be license exempt to be successful on the market, in the same way that de-licensing has been the key for the success for the Wi-Fi technology on the 2,4 and 5 GHz ISM bands. Even the earlier analog CTS band was de-licensed. As indicated in Chapter I of this Paper, de-licensing is the only globally accepted norm for private space digital CTS application. A licensing regime cannot be practically implemented for residential and SOHO applications. This is more so as the terminals are purchased off the shelf and deployed in totally uncoordinated way.

3.5 Do you agree that the 1880-1900 or 1910-1920 MHz band (TDD Mode) be allocated for digital CTS applications? If yes, what should be the limits of emitted power (EIRP), power flux density (pfd), antenna gain, etc?

Answer: The 1880-1900Mhz band (TDD mode) is already allocated for digital CTS. If in future there is more demand for digital CTS then 1910-1920 MHz band (TDD mode) could also be allocated.

Terminal power (conducted): 250 mW (24 dBm)

Antenna gain: < 12 dBi.

(This specification is taken from the European Harmonized Standard ETSI EN 301 406.)

The antenna gain of 12 dBi is used in Europe and many other countries. In some countries other values are used. E.g. in the US 3 dBi are used. In the ITU specification of DECT ITU IMT-2000 TDMA/FDMA (DECT), 4 dBi is specified.....

DECT residential and enterprise systems are installed and used indoors. This is basically a non line of sight, NLOS, environment. In dispersive NLOS environments it is in principle the total power of all reflections, rather than the emission in a specific direction, that decides which power reaches the other end point. Thus the range as well as interference estimates will basically be dependent on the totally emitted power (the conducted terminal power), and rather independent of the shape of the antenna pattern.

3.6 Do you see any coexistence issues between existing cellular systems using adjacent band with low power CTS allocations in 1880-1900 or1910-1920 MHz band?

Answer: With reference to the use of 1880-1900Mhz band for digital CTS and its interference possibilities into the adjacent cellular bands, as indicated in this paper at 2.8.3 there are plenty of documented studies on this subject as well as practical implementation in the developed world to indicate that adjacent band(cellular) interference issues do not exist. All over the world, including America and Europe, DECT systems are co-existing with cellular systems both in the 1880-1900Mhz and 1910-1920Mhz band.

3.7 Whether the de-licensing of either 1880-1900 MHz or 1910-1920MHz band for low power CTS applications will result in loss of revenue to the government?

Answer: The question of loss of revenue arises in the case of public services. CTS is a private space non-commercial application concept based on a de-licensed band as in the case of Wi-Fi bands and the earlier 46/49Mhz etc. It is adding revenue to the exchequer in terms of duties and taxes. It also enhances employment and revenue generation through manufacturing & R&D. Increased use of digital CTS will stem the decline of around 30million existing land lines, increase ARPU on them and thus bring value to the huge sunk cost. Once landlines become popular again consumer will also go in for broad band, which is a Govt. initiative for e-governance, e-health, e-education. This itself will be biggest gain for the Nation.

3.8 Will there be any potential security threat using CTS? If yes, how to address the same.

Answer: CTS is using the public PSTN network like wired phones. No difference. Furthermore, the digital CTS radio link uses ciphering and authentication with the same security level as GSM/UMTS, thus providing secure private communication within the residential or enterprise space. This is one of the main reasons for the popularity of DECT systems globally as against the other private space services provided by commercial public telecom service providers.

3.9 Amongst the various options of digital technologies available to meet the cordless telephony requirements, either spectrum allocation can be considered according to technology or the etiquettes/ specifications can be defined for the de-licensed spectrum band. What method of allocation of spectrum for digital CTS applications should be adopted?

Answer: A defined etiquette based CTS is a much better option, in fact the only practical option. Some of the etiquette parameters have already been defined by WPC in its Note 57 to the NFAP-2011. Other etiquette parameters could be added with the objective of de-licensing the band.

Series 9900 Wireless Intercom System

Belt Station/VOX
Model No. U9910-BSW(EU)
(Part No. 40992G-03)

U9910-BSW: Belt Station/VOX

DESCRIPTION

The Series 9900 Wireless Intercom System is the perfect solution for wireless intercom communications in demanding environments, such as airline/airport operations, fire/rescue applications, marine intercom, or any application requiring rugged, secure and reliable communications in and around high-noise areas.

The U9910-BSW VOX Belt Station is designed as a wireless interface, or portable part, between a headset and a wireless system Gateway or Controller. Users link to the Gateway or Controller through close-proximity linking with their individual belt stations.

A Bi-Color LED, located on the on/off/link button, provides the status of the user's wireless link, radio or intercom PTT transmit (depending on application), and battery charge. Each belt station is powered by a replaceable, rechargeable Lithium Polymer battery, which provides 24 hours of continual use.

With it's valuable and practical versatility, robust construction and ease of use, the U9910-BSW provides crisp, clear communication with confidence.

FEATURES AND BENEFITS

- Hands-free, full-duplex, voice-activated (VOX) intercom communication
- DECT based technology, provides secure signaling, prevents unwanted interception and/or cross talk with other systems or work groups
- Accommodates any Series 9900 Wireless Headset
- Controls include a power button for close-proximity linking, VOX adjustment for effective mic control, and a large PTT for VOX override/radio PTT (depending on application)
- VOX "helper" tone guides the user to optimal setting for any high-noise environment through rotary switch adjustment
- Black rubberized protective skin included for added impact protection (oil, water, UV resistant)
- Voice prompts help to ensure wireless link status
- Marine-grade, water-tight, impact-resistant enclosure for rugged durability and reliability
- 360º rotational belt clip for versatile attachment and access options
- Water-tight battery compartment houses easily removable, rechargeable Li-Polymer battery, allowing the Belt Station to stay in service with a spare cell while charging

TECHNICAL DATA

Weight	**10oz/280g (with battery)**
Frequency	**1880 MHz – 1900 MHz**
Average Power Output	**10mW (250mW peak)**
Range	**100m (300') line-of-sight, typical**
Carriers	**10 each (1,728 kHz spacing)**
Time Slots	**2 x 12 (up and down stream)**
Operating Temp.	**-10ºC to +45ºC**
Storage Temp.	**-20ºC to +60ºC**
Dimensions, Enclosure	**4" H x 2-3/4" W x 1-7/8" D (2-1/2" D with belt clip)**
Power Source	**Li-Polymer rechargeable 3.7V cell, 2000mAh**
Power Consumption/ Current Draw	**100mA, typical**

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