

The International Publication for DECT Markets, Applications, and Technology

EDITORIAL BY NICOLAS HOUERY, DECT FORUM CHAIRMAN

DECT in 1999: successful, field-proven, aligned with the future!

Two years after the creation of the DECT Forum, it is time to analyse what has been done and what remains to be activated in the promotion and tremendous success of DECT.

During this period, in which the DECT Forum has been pushing for its development, DECT has become a worldwide-established standard. Reality is that operators trust DECT: many of them have carried out field-trials with other well-marketed technologies and, based on the accomplishment on a mix of technical superiority, products availability and knowledge dissemination, DECT has finally been selected. DECT is now the leader in residential digital cordless, in wireless PBXs and in wireless Local Loop for public networks. DECT has proven to be a flexible solution for many applications.

From the DECT Forum, we have been working through the promotion of regulatory schemes world-wide, providing a platform for the development and expansion of DECT technical capabilities and ensuring that all the requirements of Operators and Manufacturers were considered in the development of this successful radio air interface. The DECT Forum has established a network of good personal and company relationship, enabled its members to have a clear and unique voice, and established a strong arena from which the future of DECT will be discussed. A bright future, showing that DECT will be there, with new data and multimedia applications, participating in the 3rd generation family or in combination with other technologies like cellular. Concepts like wireless office, Internet access, high speed data connections are becoming familiar to DECT users. The benefits of a multiservice radio interface are just getting to the market.

DECT Forum envisages that DECT technologies will maintain the growing success, experienced till now in multiple applications, on top of the 25 Million terminals sold till now, more than 50 Millions will be sold in 1999 and 2000, reaching a cumulative of 75 Million terminals by the beginning of 2001.

After its second birthday, the DECT Forum will continue to be in the forefront of the DECT developments. We are confident about DECT: successful, field-proven and aligned with the future.



The DECT Forum Mission

DECT Forum is an international organisation formed by leading telecom operators and manufacturers. DECT Forum has representatives in all the major geographical regions.

DECT Forum provides a unique platform for the exchange of experience between users, operators, regulation and standardisation bodies to ensure the sustained growth and acceptance of DECT world-wide.

DECT WLL APPLICATIONS: A COMMERCIAL SUCCESS

A Large Footprint in Latin America

Shortly after the Far-East and Africa, Latin America has become in the last few months a new success region for DECT, thus strengthening DECT's position as the world-wide preferred Wireless Local Loop (WLL) technology. In Latin America, there were activities in several fields, ranging from regulatory to commercial, to which the DECT Forum highly contributed.

Almost all Latin American countries decided to allocate the 1910-1930 MHz band for applications based on DECT leading to a big commercial success of DECT-based WLL applications in most Latin American countries in short time.

The DECT technology has been applied in Latin American countries for several years, with DECT WLL applications. Since these early deployments, the success of DECT as the leading technology for public wireless applications has grown and strengthened: there is no better way to demonstrate the success of a technology, than its deploy-

ment and operation in commercial networks.

DECT systems are deployed and operating in Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Peru and Uruguay.

Colombia is one of the Latin American countries with the highest number of DECT WLL systems in deployment and in operation. Even more, apart from the actual number of lines, almost all Colombian operators, both incumbents and newcomers, have already chosen DECT as the best-suited technology to provide telephone services in both urban and rural areas. There are DECT WLL networks in Bogota, Cali, Monteria, Manizales, Villavicencio, Medellin, etc. Projects in Bogota, Cali and Monteria are briefly described here.

The capital Bogota is the biggest city in Colombia. The project has 5'000 subscribers currently connected and will expand to 10'000 by early 1999. The traffic generated per sub-



Contents

Editorial, by Nicolas Houery	1
A Large Footprint in Latin America	1
Good News for All Applications	3
News from the Forum	2
A Specific Band for DECT	2
Status of Standards	3
Evolution to Third Generation	4
DECT 99 World Congress	4

Published by
DECT Forum
P. O. Box 215
CH-4503 Solothurn
Switzerland
<http://www.dect.ch>

Tel. +41 (32) 6217041
Fax. +41 (32) 6217043
heinz_ochsner@ibm.net

News Bits

As reported in the September 98 issue of the DECT Forum Newsletter, frequencies have been allocated in the 1910-1930 MHz band by a large number of countries in 1998: Brazil, Chile, El Salvador, Honduras, México, Panamá, Perú, República Dominicana have complemented the list of countries which already included Argentina, Bahamas, Bolivia, Colombia, Costa Rica, Ecuador, Uruguay and Paraguay.

Beside FWA applications, many countries – such as Argentina, Brazil and Chile – now also allow for a secondary allocation in the same band for private applications.

At a DECT conference held in Geneva (Switzerland) last October, Telecom Italia reported that their Fido Cordless Terminal Mobility (CTM) service now was serving close to 100'000 customers. This represents a 150% growth within the last 6 months.

The speaker also mentioned that the Fido service would additionally be targeted also to business customers.

subscriber is 100 mE at 1% Grade of Service. The services offered are voice, fax and Internet access. Cali is the second biggest city in Colombia, with a population of about 2 million people. The phone density of households is 25%. The city of Cali, sizing approximately 120 km², is fully covered with a DECT WLL system to provide telephone service to 35'000 subscribers. This first step will be completed by the end of 1998. The customer currently studies even an upgrade to 45'000 subscribers. Each subscriber generates 120 mE traffic at 0.4% Grade of Service. At a first stage, subscribers are connected to 126 different base-station sites equally distributed all over Cali. No more sites are needed for the upgrade to 45'000 subscribers. So far, this DECT WLL implementation is the biggest WLL project planned in Cali and the biggest network operating in Colombia.

The city of Monteria, in the province of Cordova, with a population of 300'000 people, is another scenario for DECT WLL. 4'000 subscribers were already connected by mid-1998, and the total project will grow up to 6'000 subscribers in the urban area. Additional 1'000 subscribers will be connected in rural neighbourhoods of Monteria.

The network provides voice, fax, voice-band data and public payphones. The DECT urban network was deployed in a record time of five and a half months, including the provision of switching and transmission

systems.

There are more examples of DECT-based WLL systems in Latin America. The city of Cuenca, capital of Azua department in the Southern part of Ecuador, has the widest DECT WLL project all across the country. Cuenca has a population of 388'000 people and a telephone density of 17.8%. Cuenca will be covered with a DECT WLL system to provide telecommunication services to 3'000 subscribers in the first phase. Each subscriber generates 80 mE traffic. The infrastructure already installed has a capacity of 3'600 subscribers, able to handle 360 Erlangs (1% Grade of Service), thus the first phase would be expanded just by adding the relevant number of DECT wireless network terminations, without any additional base station.

Uruguay, was one of the early adopters of DECT WLL systems. A major operator selected this system as the solution to reduce their long waiting list for telephone subscriber connection in the capital Montevideo. After signing the contract in Dec. 1996, the network now brings 35'000 users commercial services. The infrastructure is available for 40'000 users. The customer now has one of the world's largest commercial WLL networks deployed; he is satisfied with the system operation and performance and the positive subscriber feedback. In Bolivia, DECT has been successfully deployed across the country. Today, these systems connect over 15'000 subscribers.

In Brazil, the large trials performed in 1997 and 1998 have shown that DECT is in the forefront of WLL technologies as most of the major telecommunications manufacturers proposed it. In all cases, after reviewing the different systems according to the technical situation, the subscriber density, the environment and some other factors, operators have decided to use a DECT-based system for their projects. A major advantage of a DECT WLL is its excellent voice quality, comparable to wireline. Operators also stressed that DECT WLL systems are small, low consumption, weather-proof, easy to install and to maintain, thus providing a very cost-effective network.

A Specific Band for DECT (1910-1930 MHz)

Originally, Latin American countries had followed the PCS spectrum plan originating from the USA. This plan contains the FDD paired band 1850-1910 MHz / 1930-1990 MHz and a TDD unpaired band 1910-1930 MHz. It has thus been difficult in Latin America to obtain allocation for DECT in the original band 1880-1900 MHz.

However, in December 1996, CITEI issued a Recommendation PCC-III/REC.26(VI-96): "Identification of Spectrum for Fixed Wireless Access Systems in the Americas", recommending Administrations to allow Fixed Wireless Access (FWA) in a number of frequency bands including 1850-1990 MHz, and 1910-1930 MHz, this range becoming the de facto frequency band for DECT in Latin America.

The US Federal Communications Commission and some US companies were reluctant to include the 1910-1930 MHz band as candidate for FWA despite strong support from Latin American delegations. These North American companies alleged that TDD FWA systems would create unacceptable interference to the adjacent PCS FDD bands. It was thus decided to establish a CITEI Working Group "to Quantify any Incompatibility Issues between FWA and PCS in the Range 1850-1990 MHz".

This study on compatibility was carried out by a Working Group including DECT Forum members.

The group first agreed on a scenario based on FWA (TDD) vs PCS (FDD) interference to PCS (FDD) vs PCS (FDD) interference including propagation models, antenna types, antenna heights, output power, receiver sensitivity and other essential parameters for each considered PCS (IS-95, PCS1900, IS-136) and FWA (DECT, PHS) standards. The study was based on a specific agreed set of parameters, with a required isolation in dB or in meters for a certain degree of victim receiver desensitising, typically 1 dB.

The results were available, in September 1997, as PCC.III/doc.935/97 "Report of PCC.III Interference Experts Group on Incompatibility issues between FWA vs PCS systems". They showed that the average required isolation distances are much shorter (4 times) for FWA (TDD) vs PCS (FDD) than for PCS (FDD) vs PCS (FDD). Then, somewhat different parameters were applied for the spread sheet calculations.

In all cases DECT FWA proved lower potential interference than PCS vs PCS. Real equipment in the field even performed much better than indicated by the modulation masks used.



DECT IN 1998 AND 1999**Good Progress for DECT Voice and Data Applications****Leadership in Residential Cordless Telephony**

There is a worldwide trend towards cordless communication, and DECT, now globally accepted, is currently the most successful digital cordless standard for residential use. As an international trend, biggest growth is in digital cordless, while analogue cordless tends to decrease. The whole cordless market today is enjoying a steady growth, with about 65 million units shipped in 1998 and 100 million expected by 2002. The share of DECT units, e.g. in Germany, already tops 70% in 1998. Judging from the current growth rate, it is expected that by 2001 virtually every cordless unit sold on the German market will be a DECT device. Similar developments are expected in many European countries. Other countries like Mexico, Argentina, Brazil, Singapore and Hong Kong show promising growth for digital cordless also.

DECT cordless telephones offer high voice quality without any interference; a quality of performance that has not as yet been realised in cellular phones. DECT offers a range of mobility of up to 50 meters indoors and up to 300 meters outdoors. The encryption inherent to DECT provides high security against eavesdropping. Usually, up to 6 or 8 handsets can be connected to one base station and one of the most valuable advantages is free of charge intercommunication between those handsets.

A very wide spectrum of DECT telephones with multiple features is available on the market including basic models on entry level, telephones with integrated answering machine, hands-free speakerphone, or base stations with additional features like telephone book or VIP function for privileged callers that may get through even when the answering machine is on. Fully featured handsets have a larger display, an integrated telephone book and are easy-to-use with their interactive menus and macros. These features are also available on mini handsets that easily fit into your pocket. Today's devices provide high performance: thanks to low power consumption more than 130 hours of standby and over 10 hours of talk-time are regarded as norm.

A perfect combination is DECT together with ISDN, which offers digital transmission for voice and data. DECT allows for easy access to many ISDN features. Callers can be identified based on their telephone number. If a second call arrives during the first, it can be answered while you put the first call on hold to be returned to later. Further features are three-party conference, call forwarding and automatic callback when the line is engaged. Data transmission with 64 kbit/s is easily achieved.

Dual Mode handsets, supporting both DECT and GSM standard are also already available. This combination offers unlimited mobility with the outstanding DECT quality at home or in the office and the mobile phone functionality when you're on the road.

Today, DECT is the leading cordless telephone technology and because of its advanced basic technology and unique capabilities will still continue to grow worldwide.

DECT Data Applications Are Taking Off

The DECT standard provides a comprehensive set of profiles, optimised for different kinds of data applications. The A/B profiles support frame relay for interworking with Ethernet and Token Ring LANs, and cover Internet Protocol interworking in addition. The C profiles offer data link services, e.g. for interworking with V.24 interfaces. Provision of transparent and isochronous transfer of synchronous data services is covered by the D profile. Messaging (e.g. alphanumeric paging) is in the focus of the E profile. Fax, E-mail, World Wide Web access and SMS are specified in the F profile.

In order to get a more attractive representation the "DECT Packet Radio Service" (DPRS) standard has been created. This powerful package combines the existing A/B and C profiles. It will be easier to handle and therefore can create new momentum for the further development of data applications.

In addition a new profile for multimedia applications, mainly targeted for the SOHO markets has been defined in order to achieve better interoperability. In this profile a selection of the relevant options available in the current data profiles is combined with optional voice services offered by GAP, intended to allow terminals which do provide true integrated multimedia services comprising voice and data. Multimedia applications do require high data rates. Due to this demand a high-speed data mode using alternative modulation schema has been added to the DECT base standard. This enhancement allows data transmission with up to 2 Mbit/s.

After having a look at the standards lets talk about products. Having access to the Internet for web browsing, email, file transfer etc. is becoming more and more important. New DECT products, available early 1999, offer a cordless solution by replacing the V.24 cable connection from the PC to an analogue modem or an external ISDN adapter. The maximum data rate of 64 kbit/s is high enough to keep up with the rates currently provided by the fixed telephone networks. Anyway, as DECT is transparent for PSTN and ISDN today it will be also transparent for future network capabilities.

Small DECT modules for a cordless V.24 serial link will be available soon, ready to be integrated into a wide range of products. In shops there is a demand for point of sales terminals which can be moved easily, e.g. for a temporary promotion stand.

A barcode reader is another device in this context. Credit card payments will be simpler and more secure

**Status of Standards**

ETSI has approved the following deliverables for final vote

- EN 300175 1-8 (base standard, edition 4)
- EN 300176 1-2 (updated conformance test specs)
- EN 300444 (updated Generic Access Profile)

These deliverables are approved for Public Enquiry

- CTM Feature Pack 1 (new)
- Data Profile A.B/2 (update)
- DPRS (data Packet Radio Service, new)
- MMAP (Multimedia Access Profile, New)

Individual ETSI deliverables are now available for download from <http://www.etsi.org> (free of charge but registration necessary)

DECT 99

DECT 99 Set to be the Biggest Ever

The DECT'99 World

Congress will be held from 26th to 29th January 1999 at the Hotel Arts in Barcelona, Spain.

With the support of the DECT Forum the 1999 DECT World Congress will again provide the industry with its main meeting place.

Conference sessions will include the following topics:

- An evolving standard
- Success stories
- WLL
- Business and residential mobility
- Data solutions
- Future applications

Conference delegates may also visit the large exhibition area. Here, they may discuss DECT issues also with the DECT Forum which is at stand 13.

DECT 99 is set to be the largest gathering of the DECT industry ever. Further information on the industry meeting place can be obtained from IBC at +44 (171) 4532700

Evolution to the Third Generation

UMTS and IMT are the keywords for next generation radio networks. As DECT is the most successful digital standard for cordless applications, coexistence and evolution has to be ensured when introducing third generation radio technology. Therefore DECT has been submitted as a candidate for the IMT 2000 specification at the ITU in Geneva. The reason is that ITU has accepted to have a family of technologies instead of setting on only one. As DECT fulfils all minimum requirements of IMT-2000, this submission has been widely supported and is the only one that is fully available today.

DECT is very successful in the residential, business and WLL sector, whereas UMTS from today's perspective will start in the public mobile communication sector. There is a need for coexistence of DECT and UMTS at the beginning. DECT can offer data rates up to 2 Mbit/s. This is the maximum data rate planned for UMTS. Therefore DECT can be a good platform for first implementations of future UMTS applications. DECT is a well introduced, highly developed and proven technology that can offer cost advantages compared to other technologies. Therefore DECT will be a good choice at least for all those applications with only local mobility needs, even when UMTS has been put into operation. This secures the investment for DECT on long term.

because the data on guests cards is transmitted and checked on-line in their presence.

System integrators can make use of DECT modules for measuring or controlling equipment. Gas, water or electrical meters might be an example.

Serial links as described so far are only the start point, networking will be the next step. There is need for easy to operate wireless networks in the residential area. Data exchange from PC to PC or the control of household appliances via Phone or PC will be possible. Opening and shutting of roller blinds and adjusting the heating are some ideas. DECT is a perfect technology to implement a wireless network for Home and Small Offices.

Especially in the business area mobile access to Intranet and Internet will be required. In this context mobile data terminals (PIC, PDA) will also become more and more important. DECT will provide Intranet access for such devices too. Service technicians get access to knowledge databases wherever they are. In hospitals electronic patient records are easy accessible at the patients bed.

A cordless videophone has been demonstrated at CEBIT '98 already. The unit has an integrated camera and a high-resolution colour display. It transmits photographs, graphics or plans as required. The images can be transmitted to a PC for further electronic processing. Beside "normal" video telephony as part of our every day live such devices may be part of a door opener system. Service or security people will be able to send images to their colleagues, or they get images from different cameras on their mobile display. The applications mentioned so far can be only examples. Future developments will bring new applications. The development of DECT data applications is strongly supported by ongoing activities in the DECT Forum. A new Data Applications Workgroup has been founded, the goal of this workgroup is to identify applications, to extract requirements for specifications and to support the international success of DECT data.

Business Comms: DECT on the winning lane

Many companies buying a new PBX today recognise the benefits of DECT telephony. Up to 40 % of new installations include today a DECT cordless infrastructure. More and more companies start to appreciate also the benefit of the simple and low cost installation of a DECT network resulting in fully cordless offices.

The main advantages of DECT business systems are availability and internal mobility for the user. The system ensures that callers no longer end up at an empty desk or workplace but directly reach the person wanted. This functionality is not only limited to the company premises, the system also allows users to transfer calls to their home telephone number or to their mobile phone and vice versa. This avoids repetitive calls and saves a lot of time and costs.

Installations providing coverage up to 150'000 m² have been implemented already, e.g. at fair grounds or company premises. Constant accessibility in the whole area with seamless roaming is the main feature of such a DECT system. In addition solutions for multiple locations have been contracted, providing reachability with one individual number at every location for more than 10'000 employees.

In the business environment the customer requires to keep full control of the cost, which is not the case for those systems based on public cellular networks, even with very low rates for company internal communication. Moreover, those applications rely on the low tariffs, which are not controlled by the customer but by the operator, and will be affected by the additional costs needed to increase cellular network capacity, especially if wireless data services are required.

The company would also have to accept that specific functions from a PBX especially designed to improve communication's efficiency (secretarial support, group call handling and routing functions, etc.) are not available to the same extent in the cellular scheme.

Telecommunications is the lifeline for a company and historically severe requirements were set on quality, security, reliability, traffic handling capability, and user features of the PBX. DECT cordless business telephony has proven to comply with all these requirements and on top of that, it significantly improves the communications efficiency of a company.

The capability of DECT to offer wireless high quality and secure voice and data services with the same infrastructure will be a key success factor for business applications in the future.

