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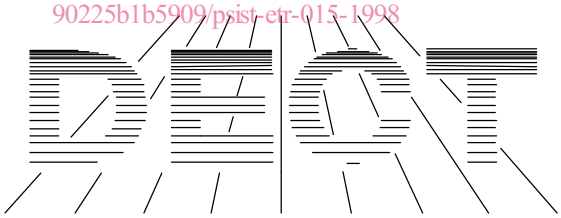

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Foreword

ETSI Technical Reports (ETRs) are informative documents resulting from ETSI studies which are not appropriate for European Telecommunication Standard (ETS) or Interim - European Telecommunication Standard (I-ETS) status.

An ETR may be used to publish material which is either of an informative nature, relating to the use or application of ETSs or I-ETSs, or which is immature and not yet suitable for formal adoption as an ETS or I-ETS.

This ETR has been produced by the Technical Committee RES, Radio Equipment and Systems, Sub-Technical Committee 3 (in charge of DECT) of the European Telecommunications Standards Institute (ETSI).

The present document aims to provide an overall description of the DECT system and concept, DECT standing for Digital European Cordless Telecommunications.

DECT : Digital European Cordless Telecommunications;

ETSI : European Telecommunications Standards Institute;

RES3 : ETSI Radio Equipment and Systems, Sub-Technical Committee 3, (in charge of DECT);

CEPT : Conférence Européenne des Postes et Télécommunications.

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1 Introduction

At the present time there are a number of incompatible cordless telephone systems within Europe. These systems fulfil only a proportion of the requirements and opportunities for personal communication expectations.

The presence of the current systems has itself encouraged an extension of the concept and expectations for cordless communication. Market research has established a clear demand for cordless capabilities beyond those currently offered.

The greatest opportunity for European telecommunications organisations lies in offering a single standard enhanced cordless system for Europe. The size of the European market and the capacity of the European manufacturing base indicates that the fulfillment of the European need will create a spring-board for opportunities outside Europe.

Only a common standard defined by industry, PTTs, and Administrations under the auspices of the European Telecommunications Standards Institute (ETSI) can open up the European market to its full potential.

1.1 The current situation

The extent to which the market is divided can be seen from a review of current products :

- Illegally imported Cordless Telephones;
- National specifications, working generally in one country (UK, France), using low frequencies under 50 MHz;
- CEPT analogue products (CT 1) working around 900 MHz, adopted only by some countries;
- A digital (FDMA) system, developed in the UK, offering the telepoint function as a feature. CT2/CAI;
- A digital (TDMA) system, developed in Sweden and emphasizing business cordless telephony. CT3.

A common European standard will remove the restriction and enhance market opportunities.

This common European standard will be DECT.

1.2 What is DECT ?

1.2.1 Basic characteristics

The DECT concept is one of versatility of application at a cost that encourages wide availability and market adoption.

The concept includes a definition of personal portable communications that requires small, easy to use terminals.

DECT will provide personal communication services at home, in the office and in the street.

The quality of communications is similar to that of a standard telephone.

DECT offers low-power cordless access between portables and infrastructure, at ranges up to several hundred meters. It is utilising dynamic channel selection from approximately 120 available channels.

1.2.2 DECT Systems

- A DECT residential system that interconnects to a PSTN with the features and responses of a standard wired telephone;

- A DECT Business Cordless Telecommunications systems (BCT) that combines the features of a PBX with the mobility of cordless telecommunications for both voice and non-voice applications;

- A DECT telepoint facility that offers public network access to a handset through a public, or privately owned, base station;

- A DECT access system that provides a radio means of extending public and private networks into customer/user premises.

1.2.3 Benefits of DECT

- Versatile application based on a common technology provides an economy of scale that will yield low cost and encourage a wide take-up.

- DECT will allow full cordless application in an average office environment (typically in one hundred times the density of a mobile radio system);

- The user has the opportunity to select from a number of communication options, to suit his particular requirements;

- The manufacturer has the option to provide competitively targeted product according to his own market perceptions;

- The network provider (public and private) has the opportunity to introduce new services and provide alternative means of network access;

- National communication authorities have the opportunity to encourage competitive service provision in new areas;

- DECT allows the use of private "on site" user applications.

2 Services definition

2.1 Introduction

In this section the service and facility requirements of envisaged cordless-telecommunication applications are considered. The approach adopted is to identify application areas, define basic service principles, determine functional capability requirements, and quantify performance parameters. Approaching the problem of definition from a user-group point of view avoids the difficult task of identifying and defining particular applications, especially applications associated with so called large business systems.

2.2 Areas of application: user group

- Residential - private use in houses and apartment blocks;

- Public Access - telepoint, phonepoint access to a PSTN;

- Small (business) CT systems - typically key systems;

- Large (business) CT systems - multi-cell PBX-based building mobile system with roaming and handover;

- Integrated services premises networks, small and large (business) applications - voice and data telephony and LAN access;

- Evolutionary applications - radio access to local public and other networks.

2.3 Service principles

- The technical system specification makes provision for both voice and non-voice transmission;

- The DECT timescale coincides with the introduction of ISDN services. The implementation of all ISDN basic rate services will be possible within the DECT specification;

- To provide the facilities and quality of service to key markets DECT minimises its use of bandwidth to that required by the service carried at any time;

- The DECT specification does not inherently pre-allocate spectrum by application and should seek to offer an integrated communication structure embracing all applications;

- The cost of implementing basic voice only operation must not be significantly penalised by the non-voice provisions in the specification;

- The potential total market for DECT is large with the consequent requirement for low-cost, small-size, high volume products, used in high-capacity applications;

- The technical system specification makes provision for interoperability of a handset unit between user groups. Interoperability is not mandatory;

  NOTE: The intention is not to preclude interoperability or hamper single user group applications.

- The user perception of the combination of quality and value of communication of DECT apparatus must be at least equal to that offered by existing wired telephone services noting there are two parties to communication.

2.4 Capability and features

Capability and features are aligned according to area of application (market segment) rather than product type. It is recognised that widely differing products could serve the same market segment, or a combination of market segments.

The technical system specification makes provision for both basic capabilities and enhancement features.

Some capabilities and features are common to the four prime areas of application (residential, public, small system and large system) and for convenience are listed as follows.

Basic capability

- Function as an equivalent replacement for a wired telephone connected directly to indirectly (e.g. via PABX) to a PSTN;

- Signalling capacity to support standard telephony features;

- Dialling and calling security;

- Emergency services.

Enhancement features

- Interface with ISDN;

- Non-voice transmission, with ability to communicate up to maximum available transmission capacity;

- Air-interface voice, and non-voice, privacy;

- Hands-free operation;

- Handsets serving a combination of market segments or services.

2.4.1 Residential use

2.4.1.1 Basic capability

- Base-station ringer.

2.4.1.2 Enhancement features

- 2 PSTN lines;
- 2 to 4 handsets;
- Intercom via the base station;
- Call transfer between handsets.

2.4.2 Public use

2.4.2.1 Basic capability

- Out-going calls only;
- Secure authentication of handset and user for billing;
- User indication of service availability on handset;
- Multiple independent network operation;
- Tandem use with other mobile systems, appropriate to car, train, plane and ship.

2.4.2.2 Features depending on infrastructure enhancements

- In-coming call (local log-on);
- In-call hand-over to adjacent telepoint base-station;
- Outgoing calls queuing capability for access to radio interface.

2.4.3 Small (business) system use

2.4.3.1 Basic capability

- Single cell;
- 20 extensions or less;
- Handset inaccessible indication at base unit;
- Secure authentication of handset.

2.4.3.2 Features depending on infrastructure enhancements

- Secure validation of handset user;
- Independent small (business) systems can be interconnected (by wire) to achieve coverage expansion without handover;

- Handsets can enrol on other units;

- Message (acknowledged paging) service.

2.4.4 Large (business) system use

No realistic judgement could be made between basic and enhancement features. It is considered essential the specified system should support the following.

2.4.4.1 Capability

- Multi-cell operation;

- Roaming (to find a person for incoming and outgoing calls within the nominated communication area);

- Handover during call;

- Normal (wired) PBX functions must be supported;

- Bearer services (to be expanded);

- Teleservices (e.g. teletext and fax);

- Handset or terminal enrolment;

- Support for systems of highly variable user densities;

- Terminals mounted in a vehicle (e.g. warehouse vehicles).

2.4.5 Non-voice services for DECT

The development of DECT will coincide with the establishment of ISDN networks and the widespread use of integrated services voice/data networks in the office. It is therefore essential that DECT can support an adequate range of non-voice services, to prevent it becoming obsolete before its introduction.

2.4.5.1 Applications

The applications of DECT data terminals fall into two categories:

- Primarily static, using DECT as a cordless drop-line bearer to a high-speed back-bone. Application areas and requirements are related to those anticipated for general network terminal usage;

- Primarily portable, for entirely new applications made possible by the DECT network link such as:

  - portable multi-media (e.g. voice and fax) mail terminal;

  - note-pad with large network-based memory;

  - portable access to personal and corporate data bases;

  - ultra-light, small network-slaved PC emulator;

  - cordless ISD videophone.