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Radio Equipment and Systems (RES); Digital European Cordless Telecommunications (DECT) Common interface Part 2: Physical layer

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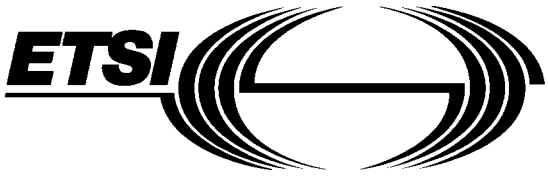

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Foreword

This European Telecommunication Standard (ETS) has been produced by the Radio Equipment and Systems (RES) Technical Committee of the European Telecommunications Standards Institute (ETSI), and was adopted, having passed through the ETSI standards approval procedure (Public Enquiry 23: 1991-09-02 to 1991-12-27, Vote 22: 1992-05-25 to 1992-07-17).

Annexes A and C to this ETS are normative. Annex B to this ETS is informative.

The technical arrangements for the DECT Common Interface are likely to become mandatory requirements within the European Community as a consequence of a forthcoming directive.

Further details of the DECT system may be found in the ETSI Technical Reports, ETR 015 [16] and ETR 043 [15], and also in the draft Technical Report, "Digital European Cordless Telecommunications; System Description Document" [17].

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1 Scope

This part of the Digital European Cordless Telecommunications (DECT) Common Interface specifies the physical channel arrangements. It is part 2 of a series of 9. DECT physical channels are radio communication paths between two radio endpoints. A radio endpoint is either part of the fixed infrastructure or a portable part, typically a handset. The assignment of one or more particular physical channels to a call is the task of higher layers.

The physical layer interfaces with the medium access control layer, and with the lower layer management entity. On the other side of the physical layer is the radio transmission medium which has to be shared extensively with other DECT users and a wide variety of other radio services. The tasks of the physical layer can be grouped into five categories:

a) to modulate and demodulate radio carriers with a bit stream of a defined rate to create a radio frequency channel;

b) to acquire and maintain bit and slot synchronisation between transmitters and receivers;

c) to transmit or receive a defined number of bits at a requested time and on a particular frequency;

d) to add and remove the synchronisation field and the Z-field used for rear end collision detection;

e) to observe the radio environment to report signal strengths.

2 Normative references

This European Telecommunication Standard (ETS) incorporates, by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to, or revisions of, any of these publications apply to this ETS only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

[1] ETS 300 175-1: "Radio Equipment and Systems; Digital European Cordless Telecommunications (DECT) Common Interface Part 1: Overview".

[2] ETS 300 175-2: "Radio Equipment and Systems; Digital European Cordless Telecommunications (DECT) Common Interface Part 2: Physical layer".

[3] ETS 300 175-3: "Radio Equipment and Systems; Digital European Cordless Telecommunications (DECT) Common Interface Part 3: Medium access control layer".

[4] ETS 300 175-4: "Radio Equipment and Systems; Digital European Cordless Telecommunications (DECT) Common Interface Part 4: Data link control layer".

[5] ETS 300 175-5: "Radio Equipment and Systems; Digital European Cordless Telecommunications (DECT) Common Interface Part 5: Network layer".

[6] ETS 300 175-6: "Radio Equipment and Systems; Digital European Cordless Telecommunications (DECT) Common Interface Part 6: Identities and addressing".

[7] ETS 300 175-7: "Radio Equipment and Systems; Digital European Cordless Telecommunications (DECT) Common Interface Part 7: Security features".

[8] ETS 300 175-8: "Radio Equipment and Systems; Digital European Cordless Telecommunications (DECT) Common Interface Part 8: Speech coding and transmission".

[9] ETS 300 175-9: "Radio Equipment and Systems; Digital European Cordless Telecommunications (DECT) Common Interface Part 9: Public access profile".

[10] Reserved.

[11] Reserved.

[12] I-ETS 300 176: "Radio Equipment and Systems; Digital European Cordless Telecommunications (DECT) Approval test specification".

[13] Reserved for future ETS version of [12].

[14] CEPT Recommendation T/SGT SF2 (89) 6/0: "Draft Recommendation T/SF Services and Facilities of Digital European Cordless Telecommunications".

[15] ETR 043: "Radio Equipment and Systems (RES); Digital European Cordless Telecommunications (DECT) Common interface Services and facilities requirements specification".

[16] ETR 015: "Digital European Cordless Telecommunications Reference Document".

[17] Draft Technical Report: "Digital European Cordless Telecommunications System Description Document".

[18] ETR 042: "Radio Equipment and Systems; Digital European Cordless Telecommunications (DECT). A guide to DECT features that influence the traffic capacity and the maintenance of high radio link transmission quality, including results of simulations".

[19] Reserved for future DECT document.

[20] International Non-Ionizing Radiation Committee of the International Radiation Protection Association (IRPA 1988): "Guide-lines on limits of exposure to radio frequency electromagnetic fields in the frequency range from 100 kHz to 300 GHz".

[21] M.A. Stuchly (1987): "Proposed revision of the Canadian recommendations on radio frequency-exposure protection" (Health Physics, Vol. 53, N° 6).

3 Definitions and abbreviations

For the purposes of this ETS the following definitions apply:

NOTE: Some definitions include a footnote in italics. This is included to aid understanding.

3.1 Definitions

Antenna diversity: implies that the Radio Fixed Part (RFP) for each bearer independently can select different antenna properties such as gain, polarisation, coverage patterns, and other features that may effect the practical coverage. A typical example is space diversity, provided by two vertically polarized antennas separated by 10 - 20 cm.

Cell: the domain served by a single antenna(e) system (including a leaky feeder) of one fixed part.

NOTE: A cell may include more than one source of radiated energy (i.e. more than one radio endpoint).

Central Control Fixed Part (CCFP): a physical grouping that contains the central elements of a fixed part. A fixed part shall contain a maximum of one CCFP.

NOTE: A CCFP controls one or more RFPs.

Channel: see physical channel.

Cluster: a logical grouping of one or more cells between which bearer handover is possible. A cluster control function controls one cluster.

NOTE: Internal handover to a cell which is not part of the same cluster can only be done by connection handover.

Connection Oriented Mode (C/O): a transmission mode that transfers data from one source point to one or more destination points using a protocol based on three phases: "set-up", "data transfer" and "release".

NOTE: Connection oriented mode requires no prearranged associations between peer entities (unlike C/L mode).

Coverage area: the area over which reliable communication can be established and maintained.

Dect NetWork (DNW): a network that uses the DECT air interface to interconnect a local network to one or more portable applications. The logical boundaries of the DECT network are defined to be at the top of the DECT network layer.

NOTE: A DECT NetWork (DNW) is a logical grouping that contains one or more fixed radio terminations plus their associated portable radio termination. The boundaries of the DECT NetWork are not physical boundaries.

Double-simplex bearer: the use of two simplex bearers operating in the same direction on two physical channels. These pairs of channels shall always use the same Radio Frequency (RF) carrier and shall always use evenly spaced slots (i.e. separated by 0,5 TDMA frame).

A double-simplex bearer shall only exist as part of a multibearer Medium Access Control (MAC) connection.

Double slot (slot): one 12th of a TDMA frame which is used to support one high capacity physical channel.

Down-link: transmission in the direction Fixed radio Termination (FT) to Portable radio Termination (PT).

Duplex bearer: the use of two simplex bearers operating in opposite directions on two physical channels. These pairs of channels shall always use the same RF carrier and shall always use evenly spaced slots (i.e. separated by 0,5 TDMA frame).

Fixed Part (DECT Fixed Part) (FP): a physical grouping that contains all of the elements in the DECT network between the local network and the DECT air interface.

NOTE: A DECT fixed part contains the logical elements of at least one fixed radio termination, plus additional implementation specific elements.

Fixed radio Termination (FT): a logical group of functions that contains all of the DECT processes and procedures on the fixed side of the DECT air interface.

NOTE: A fixed radio termination only includes elements that are defined in the DECT CI standard. This includes radio transmission elements (layer 1) together with a selection of layer 2 and layer 3 elements.

Frame: see TDMA frame or Data Link Control (DLC) frame.