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SIST TBR 010:2000

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Radijska oprema in sistemi (RES) - Digitalne izboljġane brezvrviļ ne telekomunikacije (DECT) - Sploġne zahteve za priključ evanje terminala: Aplikacije v telefoniji

Digital Enhanced Cordless Telecommunications (DECT); General terminal attachment requirements: Telephony applications

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Foreword

This 2nd edition Technical Basis for Regulation (TBR) has been produced by the Radio Equipment and Systems (RES) Technical Committee of the European Telecommunications Standards Institute (ETSI).

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1 Scope

This Technical Basis for Regulation (TBR) specifies the technical characteristics particular to telephony applications provided by terminal equipment which is capable of connection to a public telecommunications network and which uses Digital European Cordless Telecommunications (DECT). The cordless transmissions for such terminal equipment operate within the frequency band 1 880 - 1 900 MHz.

The objective of this TBR is to ensure interworking of terminal equipment via the public network.

The requirements in this TBR apply in addition to the attachment requirements for the appropriate public network (see note) and the TBR for DECT general attachment requirements.

NOTE: TBR for basic ISDN, TBR for primary rate ISDN, or national regulations (implementing ETS 300 001 [1]) for Public Switched Telephone Network (PSTN). Interconnection of a DECT terminal to a GSM network is still under study; in due course, the scope statement may need amending to reflect this point.

This TBR is applicable to simple telephony terminals as well as to the telephony function of multi-function or multi-service terminals.

This TBR includes the speech quality and transmission requirements for a 3,1 kHz telephony teleservice.

For each requirement in this TBR, a test is given, including measurement methods. The terminal equipment may be stimulated to perform the tests by additional equipment if necessary.

This TBR is not applicable to terminal equipment specially designed for the disabled (e.g. with amplification of received speech as an aid for the hard-of-hearing).

DECT comprises two equipment elements, referred to as a Fixed Part (FP) and a Portable Part (PP). This TBR is structured to allow type approval of either a) the FP and PP together, or b) the FP and PP as separate items. Where the DECT FP is connected to a PSTN, and there are any national peculiarities in the requirements for voice telephony, these shall be accommodated within the FP.

2 Normative references

This TBR 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 TBR only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

[1] ETS 300 001 (1992): "Attachments to Public Switched Telephone Network (PSTN); General technical requirements for equipment connected to an analogue subscriber interface in the PSTN (NET 4)".

[2] TBR 8 (1994): "Integrated Services Digital Network (ISDN); Telephony 3,1 kHz teleservice; Attachment requirements for handset terminals".

[3] ETS 300 111: "Integrated Services Digital Network (ISDN); Telephony 3,1 kHz teleservice; Service description".

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

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

[6] ETS 300 175-3: "Radio Equipment and Systems (RES); Digital European Cordless Telecommunications (DECT); Common Interface (CI); Part 3: Medium Access Control (MAC) layer".

[7] ETS 300 175-4: "Radio Equipment and Systems (RES); Digital European Cordless Telecommunications (DECT); Common Interface (CI); Part 4: Data Link Control (DLC) layer".

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

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

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

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

[12] ETS 300 175-9: "Radio Equipment and Systems (RES); Digital European Cordless Telecommunications (DECT); Common Interface (CI); Part 9: Public Access Profile (PAP)".

[13] ETS 300 444: "Radio Equipment and Systems (RES); Digital European Cordless Telecommunications (DECT); Generic Access Profile (GAP)".

[14] TBR 3: "Integrated Services Digital Network (ISDN); Attachment requirements for terminal equipment to connect to an ISDN using ISDN basic access".

[15] 73/23/EEC: "Council Directive of 19 February 1973 on the harmonization of the laws of the Member States relating to electrical equipment designed for use within certain voltage limits" (Low Voltage Directive).

[16] 91/263/EEC: "Council Directive of 29 April 1991 on the approximation of the laws of the Member States concerning telecommunications terminal equipment, including the mutual recognition of their conformity" (Terminal Directive).

[17] CCITT Recommendation G.101 (1988): "The transmission plan".

[18] ITU-T Recommendation G.111: "Loudness ratings (LRs) in an international connection".

[19] CCITT Recommendation G.122 (1988): "Influence of national systems on stability talker echo in international connections".

[20] CCITT Recommendation G.223 (1988): "Assumptions for the calculation of noise on hypothetical reference circuits for telephony".

[21] CCITT Recommendation G.711 (1988): "Pulse code modulation (PCM) of voice frequencies".

[22] CCITT Recommendation G.712 (1992): "Transmission performance characteristics of pulse code modulation".

[23] CCITT Recommendation G.726 (1991): "40, 32, 24, 16 kbit/s adaptive differential pulse code modulation (ADPCM)".

[24] CCITT Recommendation O.132 (1988): "Quantizing distortion measuring equipment using a sinusoidal test signal".

[25] CCITT Recommendation O.133 (1988): "Equipment for measuring the performance of PCM encoders and decoders".

[26] ITU-T Recommendation P.50 (1993): "Artificial voices".

[27] ITU-T Recommendation P.51 (1993): "Artificial mouth".

[28] ITU-T Recommendation P.57 (1993): "Artificial ears".

[29] ITU-T Recommendation P.64 (1993): "Determination of sensitivity/frequency characteristics of local telephone systems".

[30] ITU-T Recommendation P.79 (1993): "Calculation of loudness ratings for telephone sets".

[31] IEC 651: "Sound level meters".

[32] ISO 3 (1973): "Preferred numbers - series of preferred numbers".

[33] ISO DIS 9614: "Acoustics - Determination of sound power levels of noise sources using sound intensity".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of this TBR, the following definitions apply:

Acoustic Reference Level (ARL): The acoustic level that corresponds to a power level of -10 dBm0 at the TAP.

conducted measurements: Measurements which are made using a direct connection to the Equipment Under Test (EUT).

dBPa: Sound pressure level relative to 1 Pa (no weighting).

duplex bearer: The use of two simplex bearers operating in opposite directions on two physical channels. These pairs of channels always use the same radio Frequency (RF) carrier and always use evenly spaced slots (i.e. separated by 0,5 Time Division Multiple Access (TDMA) frame).

Equipment Under Test (EUT): The equipment submitted to the test laboratory for type examination.

fixed geometry PP: A PP in which the electro-acoustic transducers and their associated acoustic components are held in fixed relative positions and/or orientations during all on-line conditions of the PP.

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 1: 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 2: A fixed radio termination only includes elements that are defined in ETS 300 175 parts 1 to 8 [4] to [11]. This includes radio transmission elements (layer 1) together with a selection of layer 2 and layer 3 elements.

Full Slot (SLOT): One 24th of a TDMA frame which is used to support one physical channel.

handset echo: The echo, perceptible by the far-end user, resulting from the coupling between the receive and send directions of the handset, mostly due to acoustic coupling between transducers. It is particularly cumbersome in communications including a satellite and an echo canceller, as the DECT handset echo may be out of range of the echo canceller.

inter-operability: The capability of fixed parts and portable parts, that enable a portable part to obtain access to teleservices in more than one location area and/or from more than one operator (more than one service provider).

Local Echo Loss (LLE): The sum of the reflections measured at the digital interface of the RePP. It is calculated according to CCITT Recommendations G.122 [19], annex B4, Trapezoidal rule.

Lower Tester (LT): A logical grouping that contains the test equipment, a functionally equivalent DECT PT, a functionally equivalent DECT FT and a test controller.

network echo: The echo, perceptible by the DECT user, resulting from reflections in the network. It is mostly due to hybrid impairments at both ends of the communication. The protection consists of an additional echo loss located in the receive path of the DECT system.

Public Access Profile (PAP): A defined part of the ETS 300 175-9 [12] that ensures inter-operability between fixed parts and portable parts for public access services.

Portable Handset (PHS): A single physical grouping that contains all of the portable elements that are needed to provide a teleservice to the user.

NOTE 3: Portable handset is a subset of all possible portable parts. This subset includes all physical groupings that combine one portable radio termination plus at least one portable application in a single physical box.

Portable Part (PP): A physical grouping that contains all elements between the user and the DECT air interface. Portable Part (PP) is a generic term that may describe one or several physical pieces.

NOTE 4: A portable part is logically divided into one portable termination plus one or more portable applications.

Portable Radio Termination (PT): A logical group of functions that contains all of the DECT processes and procedures on the portable side of the DECT air interface.

NOTE 5: A PT only includes elements that are defined in ETS 300 175 parts 1 to 9 [4] to [12]. This includes radio transmission elements together with a selection of layer 2 and layer 3 elements.

public: An attribute indicating that the application of the so qualified term is used to provide access to a public network for the general public.

NOTE 6: The term does not imply any legal or regulatory aspect, nor does it imply any aspects of ownership.

Test Access Point (TAP): The Test Access Point is a digital interface with a relative level of 0 dBr providing the access to the PCM speech channels in both transmission directions.

telephony 3,1 kHz teleservice: A definition for telephony 3,1 kHz teleservice is to be found in ETS 300 111 [3].

NOTE 7: Work is currently being undertaken by ETSI to analyse the mouth-to-ear characteristics of voice communication. The results of this work could have consequences for the essential requirements of this TBR.

test laboratory: A body which performs testing and is designated to perform 3rd party testing.

variable geometry PP: A PP that allows the position and/or orientation of its electro-acoustic transducers and their associated acoustic components to be changed during all on-line conditions of the PP.

3.2 Abbreviations

For the purposes of this TBR, the following abbreviations apply:

ARL	Acoustic Reference Level
BER	Bit Error Ratio
CLRR	Circuit Loudness Rating, Receive
CLRS	Circuit Loudness Rating, Send
CSS	Composite Source Signal
dBm	dB relative to 1 mW
dBm0	The absolute power level in decibels referred to a point of zero relative level
dBr	The relative power level in decibels
ERP	Ear Reference Point
EUT	Equipment Under Test
FFT	Fast Fourier Transformation
FP	Fixed Part
FT	Fixed radio Termination
GAP	Generic Access Profile
LE	Local Echo
LNR	Low Noise Room
L_{meST}	Telephone Sidetone Path Loss
LL_e	Local Echo loss
LR	Loudness Rating
LRGP	Loudness Rating Guard-ring Position
LST	Listener Sidetone
LSTR	Listener Sidetone Rating
LT	Lower Tester
MRP	Mouth Reference Point
PABX	Private Automatic Branch Exchange
PP	Portable Part
PT	Portable radio Termination
ReFP	Reference Fixed Part (for speech testing)
RePP	Reference Portable Part (for speech testing)
RF	Radio Frequency
RLR_H	Receiving Loudness Rating of the Handset
rms	root mean square
SLR_H	Sending Loudness Rating of the Handset
SL	Linear input Signal, see CCITT Recommendation G.726 [23]
SR	Reconstructed Signal, see CCITT Recommendation G.726 [23]
Ssi(diff)	The difference of the send sensitivities between diffuse and direct sound
Ssi(direct)	The sending sensitivities for the direct sound
STMR	SideTone Masking Rating
TAP	Test Access Point
TCL	Terminal Coupling Loss
TCLw	weighted Terminal Coupling Loss
TDMA	Time Division Multiple Access
TELR	Talker Echo Loudness Rating

4 Interpretation of the measurement results

The interpretation of the results recorded in a test report for the measurements described in this TBR shall be as follows:

a) the measured value related to the corresponding limit shall be used to decide whether an equipment meets the minimum requirements of the standard;

b) the actual measurement uncertainty of the test laboratory carrying out the measurement, for each particular measurement, shall be included in the test report;

c) the values of the actual measurement uncertainty shall be, for each measurement, equal to or lower than the values in subclause 5.3.4.