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Digital Enhanced Cordless Telecommunications (DECT); Approval test specification;
Part 2: Speech

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Contents

Foreword	7
1 Scope	9
2 Normative references	10
3 Definitions and abbreviations	12
3.1 Definitions	12
3.2 Abbreviations	14
4 Interpretation of the measurement results	15
5 General test requirements	15
5.1 Test philosophy	15
5.1.1 Equipment supporting an ETSI approved profile	15
5.1.2 Equipment not supporting an ETSI approved profile	16
5.1.3 Applicant's declaration	16
5.2 Low noise room	17
5.3 Lower Tester (LT)	17
5.3.1 Description	17
5.3.2 Connections between the EUT and the LT	17
5.3.3 Functions and abilities	17
5.3.4 Measurement uncertainty	17
6 General testing conditions	18
6.1 Environment for tests	18
6.2 Power supply limitations	18
6.3 Power source	18
7 Speech and telephony tests	18
7.1 Test configurations	18
7.1.1 General	18
7.1.2 Testing a DECT system	18
7.1.3 Testing a separate PP or FP	19
7.1.4 Reference FP (ReFP) and Reference PP (RePP)	20
7.1.5 Applicability of tests	21
7.2 Digital signal level	21
7.3 General conditions of test	22
7.4 Ideal codec	22
7.5 Electro-acoustical equipment	23
7.6 Speech coding scheme	23
7.6.1 Requirement for speech coding algorithm	23
7.6.2 Applicant's declaration on speech coding algorithm	23
7.6.3 Requirement for the TAP in the FP	23
7.6.4 Applicant's declaration on the TAP in the FP	23
7.7 PP sending frequency response	24
7.7.1 Requirement	24
7.7.2 Method of measurement	24
7.8 PP receiving frequency response	24
7.8.1 Requirement	24
7.8.2 Method of measurement	25
7.9 PP loudness rating	25
7.9.1 Requirement	25
7.9.2 Method of measurement	25
7.9.2.1 SLR _H	25
7.9.2.2 RLR _H	25
7.10 User controlled volume control in the PP	25

7.10.1	Requirement	25
7.10.2	Method of measurement.....	26
	7.10.2.1 SLR _H	26
	7.10.2.2 RLR _H	26
7.11	PP talker sidetone masking rating.....	26
	7.11.1 Requirement	26
	7.11.2 Method of measurement.....	26
7.12	Listener SideTone (LST)	27
	7.12.1 LSTR requirement	27
	7.12.2 Protocol requirement for EUTs with declared noise rejection capability.....	27
	7.12.3 Method of measurement for LSTR	27
	7.12.4 Method of measurement for the protocol requirement for EUTs with declared noise rejection capability applying to be approved separately	28
	7.12.5 Applicant's declaration for the protocol requirement for EUTs applying to be approved as a DECT system.....	28
7.13	Terminal Coupling Loss (TCLw) of a PP.....	28
	7.13.1 TCLw requirement	28
	7.13.2 Protocol requirement	28
	7.13.3 Method of measurement for TCLw for a PP being approved separately.....	28
	7.13.4 Method of measurement for TCLw for a PP being approved as part of a DECT system.....	29
	7.13.5 Method of measurement for the protocol requirement for EUTs applying to be approved separately	29
	7.13.6 Applicant's declaration for the protocol requirement for EUTs applying to be approved as a DECT system.....	29
7.14	FP echo control functions with a 4-wire interface.....	30
	7.14.1 Static requirements.....	30
	7.14.2 Dynamic requirements.....	30
	7.14.2.1 Minimum TCLw	30
	7.14.2.2 Full TCLw	30
	7.14.3 Artificial echo loss of a FP with a 4-wire interface	30
	7.14.3.1 Requirement for artificial echo loss.....	30
	7.14.3.2 Requirement for the ability to disable the artificial echo loss.....	31
	7.14.3.3 Method of measurement of artificial echo loss	31
	7.14.3.4 Method of measurement for ability to disable artificial echo loss.....	31
	7.14.3.4.1 EUTs being approved as separate items.....	31
	7.14.3.4.2 EUTs being approved as a DECT system with a PP having full TCLw	31
	7.14.4 Echo control device of a FP with a 4-wire interface.....	31
	7.14.4.1 Requirement for the echo control device	31
	7.14.4.2 Requirement for the ability to disable the echo control device.....	31
	7.14.4.3 Method of measurement for the echo control device.....	32
	7.14.4.4 Method of measurement for the ability to disable the echo control function.....	32
	7.14.4.4.1 EUTs being approved as separate items.....	32
	7.14.4.4.2 EUTs being approved as a DECT system with a PP having full TCLw	32
7.15	Stability loss - fixed geometry.....	32
	7.15.1 Requirement	32
	7.15.2 Method of measurement.....	32
7.16	Stability loss variable geometry	33
	7.16.1 Requirement	33
	7.16.2 Method of measurement.....	33
7.17	Sending distortion.....	33
	7.17.1 Requirement	33
	7.17.2 Method of measurement.....	33
7.18	Receiving distortion	34
	7.18.1 Requirement	34

7.18.2	Method of measurement	34
7.19	Side tone distortion	34
7.19.1	Requirement	34
7.19.2	Method of measurement	34
7.20	Out of band (sending)	34
7.20.1	Requirement	34
7.20.2	Method of measurement	34
7.21	Out of band (receiving)	35
7.21.1	Requirement	35
7.21.2	Method of measurement	35
7.22	Sending noise	35
7.22.1	Requirement	35
7.22.2	Method of measurement	35
7.23	Sending noise (narrow band)	36
7.23.1	Requirement	36
7.23.2	Method of measurement	36
7.24	Receiving noise	36
7.24.1	Requirement	36
7.24.2	Method of measurement	36
7.25	Sampling frequency level (receiving)	36
7.25.1	Requirement	36
7.25.2	Method of measurement	36
7.26	Acoustic shock	36
7.27	DECT network delay	37
7.27.1	Requirement	37
7.27.2	Method of measurement	37
7.28	PP delay	38
7.28.1	Requirement	38
7.28.2	Method of measurement	38
7.29	FP delay	40
7.29.1	Requirement	40
7.29.2	Method of measurement	40
7.30	Echo control at the network side	41
7.30.1	Requirement	41
7.30.2	Method of measurement	41
	7.30.2.1 4-wire interface	42
	7.30.2.2 Analogue 2-wire interface	42
	7.30.2.2.1 Requirement 1	42
	7.30.2.2.2 Requirement 2	43
7.31	Variation of gain with input level-sending	44
7.31.1	Requirement	44
7.31.2	Method of measurement	44
7.32	Variation of gain with input level- receiving	45
7.32.1	Requirement	45
7.32.2	Method of measurement	45
8	Loudspeaking and handsfree telephony	45
Annex A (informative):	Essential requirement justification	46
Annex B (informative):	Description of the CSS	47
B.1	General	47
B.2	Test signal	47
B.3	Measurement	48
B.4	Calculation	49
Annex C (normative):	Description of the cross-correlation method	51
C.1	Test signal	51

C.2 Calculation	51
Annex D (informative): Acoustic shock requirements.....	52
D.1 Continuous signal	52
D.2 Peak signal	52
Annex E (informative): Bibliography	53
History	54

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[SIST ETS 300 176-2:1999](https://standards.iteh.ai/catalog/standards/sist/859ec0d8-4925-4beb-bac2-b2926791f22e/sist-ets-300-176-2-1999)

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Foreword

This 2nd edition European Telecommunication Standard (ETS) has been produced by the Radio Equipment and Systems (RES) Technical Committee of the European Telecommunications Standards Institute (ETSI).

This ETS contains text pertaining to approval testing of the Digital Enhanced Cordless Telecommunications (DECT) Common Interface. Such text should be considered as guidance to approval (or licensing) authorities.

Details of the DECT Common Interface may be found in ETS 300 175, parts 1 to 9 [1] to [9]. Further details of the DECT system may be found in ETR 015, ETR 043, and ETR 056 (see annex E).

This ETS consists of 2 parts as follows:

Part 1: "Radio";

Part 2: "Speech".

Transposition dates	
Date of adoption of this ETS:	25 October 1996
Date of latest announcement of this ETS (doa):	28 February 1997
Date of latest publication of new National Standard or endorsement of this ETS (dop/e):	31 August 1997
Date of withdrawal of any conflicting National Standard (dow):	31 August 1997

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1 Scope

This European Telecommunications Standard (ETS) specifies the approval tests applicable to all Digital Enhanced Cordless Telecommunications (DECT) equipment accessing the DECT frequency band 1 880 MHz to 1 900 MHz (including provisions for testing other or extended frequency bands) and the approval tests applicable to DECT speech transmission using CCITT Recommendation G.726 [23] ADPCM speech codec at 32 kbit/s.

The aims of this ETS are to ensure:

- efficient use of frequency spectrum;
- no harm done to any connected network and its services;
- no harm done to other radio networks and services;
- no harm done to other DECT equipment or its services;
- interworking of terminal equipment via the public telecommunications network,

through testing those provisions of ETS 300 175, parts 1 to 9 [1] to [9] which are relevant to these aims.

The tests of this ETS split into two parts:

- part 1 covers testing of radio frequency parameters, security elements and those DECT protocols that facilitate the radio frequency tests and efficient use of frequency spectrum;
- this part describes testing of DECT 32 kbit/s ADPCM speech requirements between network interface and DECT PT, or between a DECT CI air interface and alternatively a DECT PT or FT. This part 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 part 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.

NOTE: The contents of this ETS may be amended according to changes to the associated regulatory requirements.

2 Normative references

This 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 (RES); Digital European Cordless Telecommunications (DECT); Common Interface (CI); Part 1: Overview".
- [2] ETS 300 175-2: "Radio Equipment and Systems (RES); Digital European Cordless Telecommunications (DECT); Common Interface (CI); Part 2: Physical Layer".
- [3] ETS 300 175-3: "Radio Equipment and Systems (RES); Digital European Cordless Telecommunications (DECT); Common Interface (CI); Part 3: Medium Access Control (MAC) layer".
- [4] ETS 300 175-4: "Radio Equipment and Systems (RES); Digital European Cordless Telecommunications (DECT); Common Interface (CI); Part 4: Data Link Control (DLC) layer".
- [5] ETS 300 175-5: "Radio Equipment and Systems (RES); Digital European Cordless Telecommunications (DECT); Common Interface (CI); Part 5: Network (NWK) layer".
- [6] ETS 300 175-6: "Radio Equipment and Systems (RES); Digital European Cordless Telecommunications (DECT); Common Interface (CI); Part 6: Identities and addressing".
- [7] ETS 300 175-7: "Radio Equipment and Systems (RES); Digital European Cordless Telecommunications (DECT); Common Interface (CI); Part 7: Security features".
- [8] ETS 300 175-8: "Radio Equipment and Systems (RES); Digital European Cordless Telecommunications (DECT); Common Interface (CI); Part 8: Speech coding and transmission".
- [9] ETS 300 175-9: "Radio Equipment and Systems (RES); Digital European Cordless Telecommunications (DECT); Common Interface (CI); Part 9: Public Access Profile (PAP)".
- [10] 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)".
- [11] ETS 300 111: "Integrated Services Digital Network (ISDN); Telephony 3,1 kHz teleservice; Service description".
- [12] ETS 300 444: "Radio Equipment and Systems (RES); Digital European Cordless Telecommunications (DECT); Generic Access Profile (GAP)".
- [13] TBR 3: "Integrated Services Digital Network (ISDN); Attachment requirements for terminal equipment to connect to an ISDN using ISDN basic access."
- [14] TBR 8 (1994): "Integrated Services Digital Network (ISDN); Telephony 3,1 kHz teleservice; Attachment requirements for handset terminals".

- [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 ETS, 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.

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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 [1] to [8]. 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 [9] 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 [1] to [9]. 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 dB_r providing the access to the PCM speech channels in both transmission directions.