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Digital cellular telecommunications system (Phase 2) (GSM); Transmission planning aspects of the speech service in the GSM Public Land Mobile Network (PLMN) system (GSM 03.50)

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ICS:

33.070.50	Globalni sistem za mobilno telekomunikacijo (GSM)	Global System for Mobile Communication (GSM)
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GSM

GLOBAL SYSTEM FOR
MOBILE COMMUNICATIONS

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**Digital cellular telecommunications system (Phase 2);
Transmission planning aspects of the speech service in the
GSM Public Land Mobile Network (PLMN) system
(GSM 03.50)**

ETSI

European Telecommunications Standards Institute

ETSI Secretariat

Postal address: F-06921 Sophia Antipolis CEDEX - FRANCE

Office address: 650 Route des Lucioles - Sophia Antipolis - Valbonne - FRANCE

X.400: c=fr, a=atlas, p=etsi, s=secretariat - **Internet:** secretariat@etsi.fr

Tel.: +33 92 94 42 00 - Fax: +33 93 65 47 16

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Foreword

This European Telecommunication Standard (ETS) has been produced by the Special Mobile Group (SMG) Technical Committee (TC) of the European Telecommunications Standards Institute (ETSI).

This ETS describes the transmission planning aspects pertaining to the speech service within the digital cellular telecommunications system (Phase 2). This ETS corresponds to GSM Technical Specification (GSM-TS) GSM 03.50 version 4.2.0.

The specification from which this ETS has been derived was originally based on CEPT documentation, hence the presentation of this ETS may not be entirely in accordance with the ETSI/PNE rules.

Reference is made within this ETS to GSM-TSs (NOTE).

NOTE: TC-SMG has produced documents which give the technical specifications for the implementation of the European digital cellular telecommunications system. Historically, these documents have been identified as GSM Technical Specifications (GSM-TSs). These TSs may have subsequently become I-ETTs (Phase 1), or ETSS (Phase 2), whilst others may become ETSI Technical Reports (ETRs). GSM-TSs are, for editorial reasons, still referred to in current GSM ETSS.

Transposition dates	
Date of adoption of this ETS:	31 January 1996
Date of latest announcement of this ETS (doa):	30 April 1996
Date of latest publication of new National Standard or endorsement of this ETS (dop/e):	31 October 1996
Date of withdrawal of any conflicting National Standard (dow):	31 October 1996

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1 General

1.1 Scope

This European Telecommunication Standard (ETS) is concerned with the transmission planning aspects pertaining to the speech service in the pan-European PLMN system. Due to technical and economic factors, there cannot be full compliance with the general characteristics of international telephone connections and circuits recommended by CCITT.

This ETS gives guidance as to the precautions, measures and minimum requirements needed for successful interworking of the PLMN with the national and international PSTN. The Recommendation identifies a number of routing and network configurations. The objective is to reach a quality as close as possible to CCITT standards in order to safeguard the performance seen by PSTN customers.

1.2 Normative references

This ETS incorporates by dated and 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. Unless otherwise stated, all references to CCITT Recommendations are from the Blue Book (1989).

- [1] GSM 01.04 (ETR 100): "European digital cellular telecommunication system (Phase 2); Abbreviations and acronyms".
- [2] GSM 03.04 (ETS 300 524): "European digital cellular telecommunication system (Phase 2); Signalling requirements relating to routing of calls to mobile subscribers".
- [3] GSM 06.01 (ETS 300 580-1): "European digital cellular telecommunication system (Phase 2); Full rate speech processing functions".
- [4] GSM 06.10 (ETS 300 580-2): "European digital cellular telecommunication system (Phase 2); Full rate speech transcoding".
- [5] GSM 06.11 (ETS 300 580-3): "European digital cellular telecommunication system (Phase 2); Substitution and muting of lost frames for full rate speech channels".
- [6] GSM 06.12 (ETS 300 580-4): "European digital cellular telecommunication system (Phase 2); Comfort noise aspect for full rate speech traffic channels".
- [7] GSM 06.31 (ETS 300 580-5): "European digital cellular telecommunication system (Phase 2); Discontinuous Transmission (DTX) for full rate speech traffic channel".
- [8] GSM 06.32 (ETS 300 580-6): "European digital cellular telecommunication system (Phase 2); Voice Activity Detection (VAD)".
- [9] GSM 06.02 (ETS 300 581-1): "European digital cellular telecommunication system (Phase 2); Half rate speech processing functions".
- [10] GSM 06.20 (ETS 300 581-2): "European digital cellular telecommunication system (Phase 2); Half rate speech transcoding".
- [11] GSM 06.21 (ETS 300 581-3): "European digital cellular telecommunication system (Phase 2); Substitution and muting of lost frames for half rate speech traffic channels".
- [12] GSM 06.22 (ETS 300 581-4): "European digital cellular telecommunication system (Phase 2); Comfort noise aspects for half rate speech traffic channels".

- [13] GSM 06.41 (ETS 300 581-5): "European digital cellular telecommunication system (Phase 2); Discontinuous Transmission (DTX) for half rate speech traffic channels".
- [14] GSM 06.42 (ETS 300 581-6): "European digital cellular telecommunication system (Phase 2); Voice Activity Detection (VAD) for half rate speech traffic channels".
- [15] ETS 300 085 (1990): "Integrated Services Digital Network (ISDN); 3,1 kHz telephony teleservice; Attachment requirements for handset terminals".
- [16] CCITT Recommendation G.103: "Hypothetical reference connections".
- [17] CCITT recommendation G.111: "Loudness ratings (LRs) in an international connections".
- [18] CCITT Recommendation G.113: "Transmission impairments".
- [19] CCITT Recommendation G.114: "Mean one-way propagation time".
- [20] CCITT Recommendation G.121: "Loudness ratings (LRs) of national systems".
- [21] CCITT Recommendation G.122: "Influence of national systems on stability, talker echo, and listener echo in international connections".
- [22] CCITT Recommendation G.131: "Stability and echo".
- [23] CCITT Recommendation G.165: "Echo cancellers".
- [24] CCITT Recommendation G.223: "Assumptions for the calculation of noise on hypothetical reference circuits for telephony".
- [25] CCITT Recommendation G.703: "Physical/electrical characteristics of hierarchical digital interfaces".
- [26] CCITT Recommendation G.711: "Pulse code modulation (PCM) of voice frequencies".
- [27] CCITT Recommendations G.712: "Transmission performance characteristics of pulse code modulation".
- [28] CCITT Recommendations G.714: "Separate performance characteristics for the send and receive sides of PCM channels applicable to 4-wire voice frequency interfaces".
- [29] CCITT Recommendations M.1020: "Characteristics of special quality".
- [30] CCITT Recommendations M.1025: "Characteristics of special quality international leased circuits with basic bandwidth conditioning".
- [31] CCITT Recommendations M.1030: "Characteristics of ordinary quality international leased circuits forming part of private switched telephone networks".
- [32] CCITT Recommendations M.1040: "Characteristics of ordinary quality international leased circuits".
- [33] CCITT Recommendation O.132 (1988), "Specification for a quantizing distortion measuring apparatus using a sinusoidal test signal."
- [34] CCITT Recommendation P.11: "Effect of transmission impairments".

- [35] CCITT Recommendation P.34: "Transmission characteristics of hands-free telephones".
- [36] CCITT Recommendation P.38: "Transmission characteristics of operator telephone systems (OTS)".
- [37] CCITT Recommendation P.50: "Artificial voices".
- [38] CCITT Recommendation P.51 (1988), "Artificial mouths and artificial ears."
- [39] CCITT Recommendation P.64 (1988), "Determination of sensitivity/frequency characteristics of local telephone systems to permit calculation of their loudness ratings."
- [40] CCITT Recommendation P.76 (1988), "Determination of loudness ratings; fundamental principles."
- [41] CCITT Recommendation P.79 (1988), "Calculation of loudness ratings."
- [42] CCITT Recommendation Q.35: "Technical characteristics of tones for the telephone service".
- [43] CCITT Recommendation Q.551: "Transmission characteristics of digital exchanges".
- [44] CCITT Blue Book (1988), Volume V, Supplement 13, "Noise spectra."
- [45] ISO 3 - 1973: "Preferred numbers - series of preferred numbers."

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1.3 Definitions and abbreviations

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In addition to those below, the definitions and abbreviations used in this specification are listed in GSM 01.04.

ADC	Analogue to Digital Converter
ADPCM	Adaptive Differential Pulse Code Modulation
AEC	Acoustic Echo Control
BSC'	Base Station Controller (excluding transmission systems)
BTS'	Base Transceiver Station (excluding transmission systems)
DAC	Digital to Analogue Converter
DMR	Digital Mobile Radio
DSI	Digital Speech Interpolation
EEC	Electric Echo Control
EL	Echo Loss
ERP	Ear Reference Point
FDM	Frequency Division Multiplex
LSTR	Listener Sidetone Rating
MRP	Mouth Reference Point
OLR	Overall Loudness Rating
PCM	Pulse Code Modulation
POI	Point of Interconnection (with PSTN)
RLR	Receiver Loudness Rating
SLR	Send Loudness Rating
STMR	Sidetone Masking Rating
UPCMI	13-bit Uniform PCM Interface