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**European digital cellular telecommunications system (Phase 2);
GSM Public Land Mobile Network (PLMN)
access reference configuration
(GSM 04.02)**

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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 reference configuration access to a GSM PLMN within the European digital cellular telecommunications system (Phase 2) and correspond to GSM technical specification, GSM 04.02 version 4.0.4.

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 Technical Specifications (GSM-TSs) (NOTE).

Reference is also made within this ETS to GSM 0x.xx. series. The specifications in the series can be identified, with their full title, within the normative reference Clause of this ETS by the first two digits of their GSM reference number e.g. GSM 09.xx series, refers to GSM 09.01, GSM 09.02 etc.

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-TS). 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 GSM ETSS.

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1 General

1.1 Scope

This Technical Specification describes the reference configuration for access to a GSM PLMN.

A user accesses a GSM PLMN via a number of interfaces, including the MS-BS interface. The purpose of this Technical Specification is to indicate the possible access arrangements that may be used in conjunction with the MS-BS interface.

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.

- [1] GSM 01.04 (ETR 100): "European digital cellular telecommunications system (Phase 2); Abbreviations and acronyms".
- [2] GSM 02.02 (prETS 300 501): "European digital cellular telecommunications system (Phase 2); Bearer Services (BS) supported by a GSM Public Land Mobile Network (PLMN)".
- [3] GSM 04.01 (prETS 300 550): "European digital cellular telecommunications system (Phase 2); Mobile Station - Base Station System (MS - BSS) interface General aspects and principles".
- [4] GSM 04.03 (prETS 300 552): "European digital cellular telecommunications system (Phase 2); Mobile Station - Base Station System (MS - BSS) interface Channel structures and access capabilities".
- [5] GSM 04.04 (prETS 300 553): "European digital cellular telecommunications system (Phase 2); layer 1 General requirements".
- [6] GSM 04.05 (prETS 300 554): "European digital cellular telecommunications system (Phase 2); Data Link (DL) layer General aspects".
- [7] GSM 04.06 (prETS 300 555): "European digital cellular telecommunications system (Phase 2); Mobile Station - Base Station System (MS - BSS) interface Data Link (DL) layer specification".
- [8] GSM 04.07 (prETS 300 556): "European digital cellular telecommunications system (Phase 2); Mobile radio interface signalling layer 3 General aspects".
- [9] GSM 04.08 (prETS 300 557): "European digital cellular telecommunications system (Phase 2); Mobile radio interface layer 3 specification".
- [10] GSM 04.10 (prETS 300 558): "European digital cellular telecommunications system (Phase 2); Mobile radio interface layer 3 Supplementary services specification General aspects".
- [11] GSM 04.11 (prETS 300 559): "European digital cellular telecommunications system (Phase 2); Point-to-Point (PP) Short Message Service (SMS) support on mobile radio interface".
- [12] GSM 04.12 (prETS 300 560): "European digital cellular telecommunications system (Phase 2); Short Message Service Cell Broadcast (SMSCB) support on the mobile radio interface".

- [13] GSM 04.13 (prETS 300 561): "European digital cellular telecommunications system (Phase 2); Performance requirements on mobile radio interface".
- [14] GSM 04.21 (prETS 300 562): "European digital cellular telecommunications system (Phase 2); Rate adaption on the Mobile Station - Base Station System (MS - BSS) interface".
- [15] GSM 04.22 (prETS 300 563): "European digital cellular telecommunications system (Phase 2); Radio Link Protocol (RLP) for data and telematic services on the Mobile Station - Base Station System (MS - BSS) interface and the Base Station System - Mobile-services Switching Centre (BSS - MSC) interface".
- [16] GSM 04.80 (prETS 300 564): "European digital cellular telecommunications system (Phase 2); Mobile radio interface layer 3 supplementary services specification Formats and coding".
- [17] GSM 04.81 (prETS 300 565): "European digital cellular telecommunications system (Phase 2); Line identification supplementary services - Stage 3".
- [18] GSM 04.82 (prETS 300 566): "European digital cellular telecommunications system (Phase 2); Call Forwarding (CF) supplementary services - Stage 3".
- [19] GSM 04.83 (prETS 300 567): "European digital cellular telecommunications system (Phase 2); Call Waiting (CW) and Call Hold (HOLD) supplementary services - Stage 3".
- [20] GSM 04.84 (prETS 300 568): "European digital cellular telecommunications system (Phase 2); MultiParty (MPTY) supplementary services - Stage 3".
- [21] GSM 04.85 (prETS 300 569): "European digital cellular telecommunications system (Phase 2); Closed User Group (CUG) supplementary services - Stage 3".
- [22] GSM 04.86 (prETS 300 570): "European digital cellular telecommunications system (Phase 2); Advice of Charge (AoC) supplementary services - Stage 3".
- [23] GSM 04.88 (prETS 300 571): "European digital cellular telecommunications system (Phase 2); Call Barring (CB) supplementary services - Stage 3".
- [24] GSM 04.90 (prETS 300 572): "European digital cellular telecommunications system (Phase 2); Unstructured supplementary services operation - Stage 3".
- [25] GSM 05.01 (prETS 300 573): "European digital cellular telecommunications system (Phase 2); Physical layer on the radio path General description".
- [26] GSM 05.02 (prETS 300 574): "European digital cellular telecommunications system (Phase 2); Multiplexing and multiple access on the radio path".
- [27] GSM 05.03 (prETS 300 575): "European digital cellular telecommunications system (Phase 2); Channel coding".
- [28] GSM 05.04 (prETS 300 576): "European digital cellular telecommunications system (Phase 2); Modulation".
- [29] GSM 05.05 (prETS 300 577): "European digital cellular telecommunications system (Phase 2); Radio transmission and reception".
- [30] GSM 05.08 (prETS 300 578): "European digital cellular telecommunications system (Phase 2); Radio subsystem link control".

- [31] GSM 05.10 (prETS 300 579): "European digital cellular telecommunications system (Phase 2); Radio subsystem synchronisation".
- [32] GSM 05.90 (ETR 108): "European digital cellular telecommunications system (Phase 2); GSM Electro Magnetic Compatibility (EMC) considerations".
- [33] GSM 07.01 (prETS 300 582): "European digital cellular telecommunications system (Phase 2); General on Terminal Adaptation Functions (TAF) for Mobile Stations (MS)".
- [34] GSM 07.02 (prETS 300 583): "European digital cellular telecommunications system (Phase 2); Terminal Adaptation Functions (TAF) for services using asynchronous bearer capabilities".
- [35] GSM 07.03 (prETS 300 584): "European digital cellular telecommunications system (Phase 2); Terminal Adaptation Functions (TAF) for services using synchronous bearer capabilities".
- [36] CCITT Series V Recommendations: "Data communication over the Telephone network".
- [37] CCITT Series X Recommendations: "Data communication networks".
- [38] CCITT Recommendation I.420: "Basic user-network interface".

1.3 Definitions and abbreviations

Abbreviations used in this specification are listed in GSM 01.04

2 General definitions

The following definitions 2.1-2.3 are based on those used for ISDN.

2.1 Reference Configurations

Reference Configurations are conceptual configurations useful in identifying access arrangements to a network. Two concepts are used in defining reference configurations:

reference points and functional groups.

2.2 Functional Groups

Functional Groups are sets of functions which may be needed in network access arrangements. In a particular access arrangement, specific functions in a functional group may or may not be present. Note that specific functions in a functional group may be performed in one or more pieces of equipment.

2.3 Reference Points

Reference Points are the conceptual points dividing functional groups. In a specific access arrangement, a reference point may correspond to a physical interface between pieces of equipment, or there may not be any physical interface corresponding to the reference point.

The following definition is used in this Technical Specification:

2.4 GSM Interface Points

GSM Interface Points are reference points within a GSM PLMN at which a GSM specified interface is always identified.

3 GSM Reference Configuration

The reference configuration for GSM PLMN access interfaces is shown in figure 1.

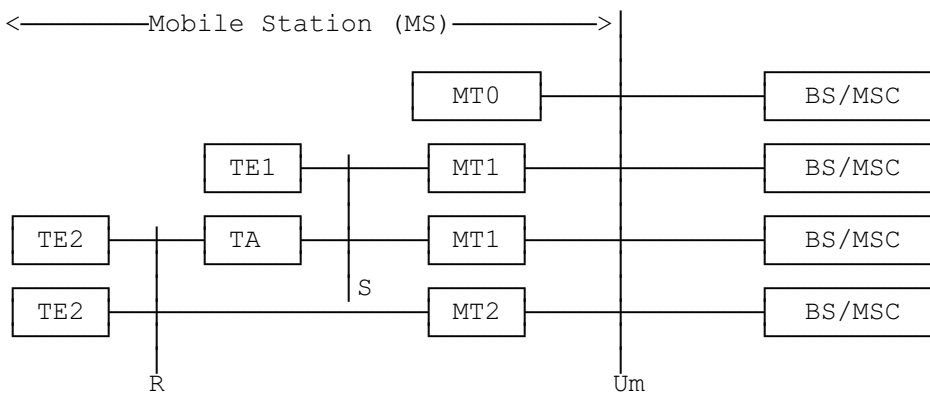


Figure 1: GSM PLMN Access Reference Configuration

The terminal equipment functional groups TE1, TE2 and TA are conceptually the same functional groups as those in the ISDN. The two new functional groups are:

3.1 Mobile Termination (MT)

which performs the following functions:

- radio transmission termination;
- radio transmission channel management;
- terminal capabilities, including presentation of a man-machine interface to a user;
- speech encoding/decoding;
- error protection for all information sent across the radio path. This includes FEC (forward error correction) and, for signalling and user data (except for transparent data services), ARQ (automatic request for retransmission);
- flow control of signalling and mapping of user signalling to/from PLMN access signalling;
- flow control of user data (except for transparent data services) and mapping of flow control for asynchronous transparent data services;
- rate adaptation of user data between the radio channel rate and user rates;
- multiple terminal support;
- mobility management.

There are three types of MT:

- MT0 includes functions belonging to the functional group MT, with support of no terminal interfaces.
- MT1 includes functions belonging to the functional group MT, and with an interface that complies with the GSM recommended subset of the ISDN user-network interface specifications.
- MT2 includes functions belonging to the functional group MT, and with an interface that complies with the GSM recommended subset of the CCITT X or V series interface recommendations.

The MT plus any TE/(TE + TA) constitutes the Mobile Station, MS.

NOTE: The GSM recommended subsets of interfaces are specified in Technical Specification GSM 02.02.

3.2 Base Station + MSC (BS/MSC)

which include the following functions:

- radio transmission termination;
- speech transcoding;
- radio transmission channel management;
- error protection for all information sent across the radio path. This includes FEC (forward error correction) and for signalling and user data (except for transparent data services), ARQ (automatic request for retransmission);
- link layer functions for signalling across the radio path;
- MS-BS circuit establishment and release functions;
- handover functions;
- rate adaptation of user data.

4 Physical Realisation

In a GSM PLMN, the reference point Um is a GSM interface point, i.e. it is always implemented as a physical interface (according to GSM Technical Specifications in the 04 and 05 series). The reference points S and R may be optionally implemented as physical interfaces. The implementation of interfaces at these reference points is according to Technical Specifications GSM 07.01, 07.02 and 07.03.

Figure 2 gives examples of configurations illustrating combinations of physical interfaces at reference points R and S. The examples shown are not exhaustive, but only serve to illustrate possible implementations of the respective functional blocks.

Example (a) of figure 2 illustrates a fully integrated MS including data terminal functions within the mobile station equipment.

Example (b) of figure 2 illustrates the connection of a TE1 in accordance with Technical Specifications GSM 07.02/07.03 (and CCITT Recommendation I.420). In this example the speech service is offered via the TE1.

Example (c) of figure 2 illustrates the connection of a TE2 by a CCITT X or V series interface according to Technical Specifications GSM 07.02 and 07.03.

Example (d) of figure 2 illustrates the connection of a TE2 by means of an ISDN TA to the MT equipment.

Example (e) of figure 2 illustrates the connection of a speech only MS.

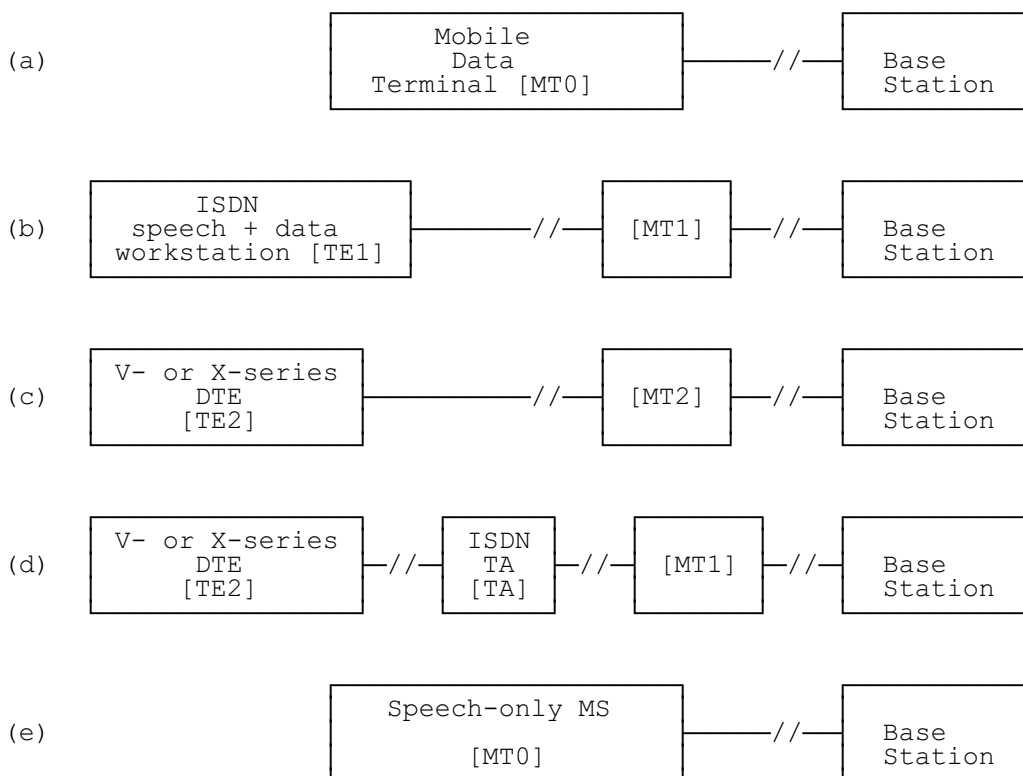


Figure 2: Examples of physical implementations

History

Document history	
September 1994	First Edition
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