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Technical Specification

Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); GSM-UMTS Public Land Mobile Network (PLMN) Access Reference Configuration (3GPP TS 24.002 version 5.1.1 Release 5)

GLOBAL SYSTEM FOR MOBILE COMMUNICATIONS

Reference

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Foreword

This Technical Specification (TS) has been produced by ETSI 3rd Generation Partnership Project (3GPP).

The present document may refer to technical specifications or reports using their 3GPP identities, UMTS identities or GSM identities. These should be interpreted as being references to the corresponding ETSI deliverables.

The cross reference between GSM, UMTS, 3GPP and ETSI identities can be found under http://webapp.etsi.org/key/queryform.asp .

Contents

Foreword

This Technical Specification has been produced by the 3rd Generation Partnership Project (3GPP).

The contents of the present document are subject to continuing work within the TSG and may change following formal TSG approval. Should the TSG modify the contents of the present document, it will be re-released by the TSG with an identifying change of release date and an increase in version number as follows:

Version x.y.z

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x the first digit:

1 presented to TSG for information;

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y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.

z the third digit is incremented when editorial only changes have been incorporated in the document.

1 Scope

The present document describes the reference configuration for access to a PLMN.

A user accesses a PLMN via a number of interfaces, including the MS-BS (in A/Gb mode and GERAN Iu mode) and UE-UTRAN (in UTRAN Iu mode) interface. The purpose of this Technical Specification is to indicate the possible access arrangements that may be used in conjunction with the MS-BS (in A/Gb mode and GERAN Iu mode) and UE-UTRAN (in UTRAN Iu mode) interface.

1.1 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.

- For a specific reference, subsequent revisions do not apply.

- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

[1]   Void.

[2]   3GPP TS 22.002: "Circuit Bearer Services (BS) supported by a Public Land Mobile Network (PLMN)".

[3]   3GPP TS 44.001: "Mobile Station - Base Station System (MS - BSS) interface General aspects and principles".

[4]   3GPP TS 44.003: "Mobile Station - Base Station System (MS - BSS) interface Channel structures and access capabilities".

[5]   3GPP TS 44.004: "Layer 1 General requirements".

[6]   3GPP TS 44.005: "Data Link (DL) layer General aspects".

[7]   3GPP TS 44.006: "Mobile Station - Base Station System (MS - BSS) interface Data Link (DL) layer specification".

[8]   3GPP TS 24.007: "Mobile radio interface signalling layer 3 General aspects".

[9]   3GPP TS 24.008: "Mobile radio interface Core Network protocol layer 3 specification".

[10]   3GPP TS 24.010: "Mobile radio interface layer 3 Supplementary services specification General aspects".

[11]   3GPP TS 24.011: "Point-to-Point (PP) Short Message Service (SMS) support on mobile radio interface".

[12]   3GPP TS 24.012: "Short Message Service Cell Broadcast (SMSCB) support on the mobile radio interface".

[13]   3GPP TS 44.013: "Performance requirements on mobile radio interface".

[14]   3GPP TS 44.021: "Rate adaption on the Mobile Station - Base Station System (MS - BSS) interface".

[15]   3GPP TS 24.022: "Radio Link Protocol (RLP) for circuit switched bearer and teleservices".

[16]   3GPP TS 24.080: "Mobile radio interface layer 3 supplementary services specification Formats and coding".

[17]   3GPP TS 24.081: "Line identification supplementary services - Stage 3".

[18]   3GPP TS 24.082: "Call Forwarding (CF) supplementary services - Stage 3".

[19]   3GPP TS 24.083: "Call Waiting (CW) and Call Hold (HOLD) supplementary services - Stage 3".

[20]   3GPP TS 24.084: "MultiParty (MPTY) supplementary services - Stage 3".

[21]   3GPP TS 24.085: "Closed User Group (CUG) supplementary services - Stage 3".

[22]   3GPP TS 24.086: "Advice of Charge (AoC) supplementary services - Stage 3".

[23]   3GPP TS 24.088: "Call Barring (CB) supplementary services - Stage 3".

[24]   3GPP TS 24.090: "Unstructured supplementary services operation - Stage 3".

[25]   3GPP TS 45.001: "Physical layer on the radio path General description".

[26]   3GPP TS 45.002: "Multiplexing and multiple access on the radio path".

[27]   3GPP TS 45.003: "Channel coding".

[28]   3GPP TS 45.004: "Modulation".

[29]   3GPP TS 45.005: "Radio transmission and reception".

[30]   3GPP TS 45.008: "Radio subsystem link control".

[31]   3GPP TS 45.010: "Radio subsystem synchronisation".

[32]   Void.

[33]   3GPP TS 27.001: "General on Terminal Adaptation Functions (TAF) for Mobile Stations (MS)".

[34]   3GPP TS 27.002: "Terminal Adaptation Functions (TAF) for services using asynchronous bearer capabilities".

[35]   3GPP TS 27.003: "Terminal Adaptation Functions (TAF) for services using synchronous bearer capabilities".

[36]   ITU-T Series V Recommendations: "Data communication over the Telephone network".

[37]   ITU-T Series X Recommendations: "Data communication networks".

[38]   ITU-T Recommendation I.420: "Basic user-network interface".

[39]   3GPP TR 21.905: " Vocabulary for 3GPP Specifications ".

[40]   3GPP TS 23.910: "Circuit Switched Data Bearer Services".

[41]   3GPP TS 25.322: "Radio Link Control (RLC) Protocol Specification".

[42]   ITU-T Recommendation V.24 (1996):"List of definitions for interchange circuits between data terminal equipment (DTE) and data circuit-terminating equipment (DCE)".

[43]   ITU-T Recommendation V.28 (1993): "Electrical characteristics for unbalanced double-current interchange circuits".

[44]   Infrared Data Association IrDA: "IrPHY Physical layer signalling standard".

[45]   Personal Computer Memory Card Association: "PCMCIA 2.1 or PC-Card 3.0 electrical specification or later revisions".

[46]   3GPP TS 43.051: "GSM/EDGE Radio Access Network (GERAN) overall description, stage 2"

1.2   Abbreviations

Abbreviations used in the present document are listed in 3GPP TR 21.905.

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. 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.

2.4   Interface Points

Interface Points are reference points within a PLMN at which a 3GPP specified interface is always identified.

2.5   Terminal Definitions

The term 'mobile station' (MS) in the present document is synonymous with the term 'user equipment' (UE) in 3G terminology as defined in 3GPP TR 21.905.
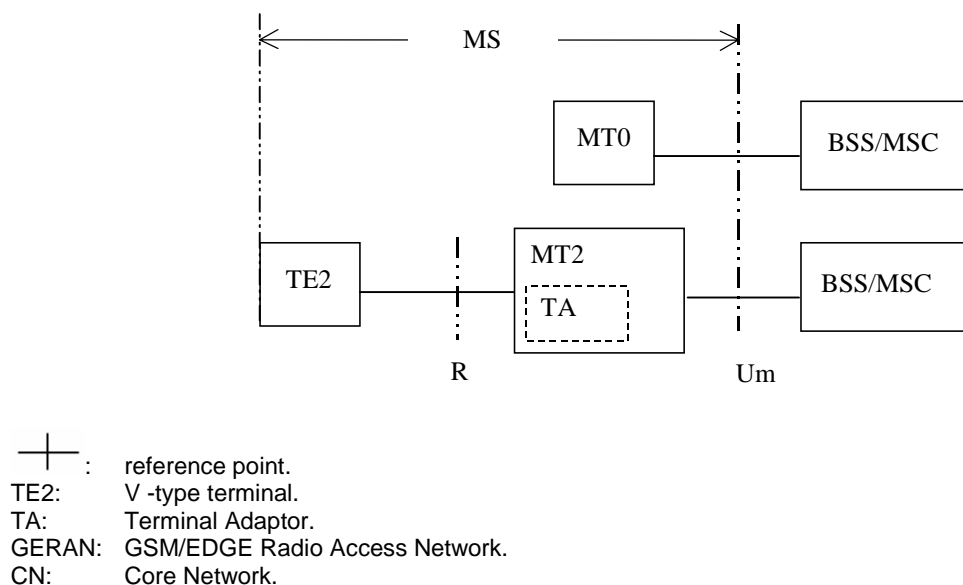
The term 'TE2' in the present document is synonymous with the term 'TE' in 3G terminology as defined in 3GPP TR 21.905.

The term 'MT2' in the present document is synonymous with the term 'MT' in 3G terminology as defined in 3GPP TR 21.905.

3 Reference Configuration

The reference configuration for PLMN (in A/Gb mode and GERAN Iu mode) access interfaces is shown in figure 1.

:   reference point.
TE2:   V -type terminal.
TA: Terminal Adaptor.
GERAN: GSM/EDGE Radio Access Network.
CN: Core Network.

Figure 1: PLMN Access Reference Configuration (in A/Gb mode and GERAN Iu mode)

There are two types of MT:

- MT0 includes functions belonging to the functional group MT, with support of no terminal interfaces.

- MT2 includes functions belonging to the functional group MT, and with an interface that complies with the 3GPP TS 27.00z series Terminal Adaptation Function specifications. Accordingly, the interchange circuit mapping at the MT2 to TE interface shall comply with the ITU-T V.24 [42] recommendation; while the physical implementation shall conform either to the ITU-T V.28 [43], or to the IrDA IrPHY Physical signalling standard specification [44], or to the PCMCIA 2.1[45], or to the PC-Card 3.0[45], electrical specification or to later revisions.

The MT plus any TE constitutes the Mobile Station, MS.

The terminal equipment functional groups TE2 and TA are conceptually the same functional groups as those in the ISDN.

The reference configuration for PLMN (Iu mode) access interfaces is shown in figure 2.
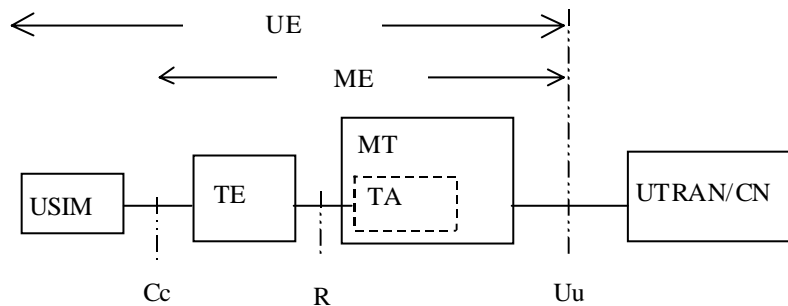
- : reference point.
TA: Terminal Adaptor.
MT: Mobile Termination.
ME: Mobile Equipment.
UE: User Equipment
UTRAN: UMTS Radio Access Network.
CN: Core Network.

Figure 2: PLMN Access Reference Configuration (UTRAN Iu mode)

There is no reference point identified for the TA Function. The TA Function is considered as a part of the Mobile Termination and with an interface that complies with the 3GPP TS 27.00z series Terminal Adaptation Function specifications.

3.1   Mobile Termination (MT)

The MT performs the following functions, 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 (see 3GPP TS 44.021[14]) and data formatting for the transmission SAP (3GPP TS 25.322);

- multiple terminal support;

- mobility management.

3.2 Void

4 Physical Realisation

In a PLMN, the reference point Um/Uu is an interface point, i.e. it is always implemented as a physical interface (according to 3GPP Technical Specifications in the 44, 45, 24 and 25 series). The R reference point may be optionally implemented as physical interface. The implementation of interfaces at this reference point is according to Technical Specifications 3GPP TS 27.001, 27.002 and 27.003.

Figure 3 gives examples of configurations illustrating combinations of physical interfaces at the R reference point. The examples shown are not exhaustive, but only serve to illustrate possible implementations of the respective functional blocks.

Example (a) of figure 3 illustrates a fully integrated MS including data terminal functions within the mobile station equipment.

Example (c) of figure 3 illustrates the connection of a TE2 by an ITU-T V series interface according to Technical Specifications 3GPP TS 27.002 and 27.003.

Example (d) of figure 3 illustrates the connection of a MT2 PCMCIA card to a TE2 by a PCMCIA 2.1 interface according to the Technical Specifications 3GPP TS 27.002 and 27.003.

Example (f) of figure 3 illustrates the connection of a speech only MS.

```
           +---------------------+        +-----------+
           |       Mobile        |        |           |
    (a)    |        Data         +-----//--|  Base     |
           |  Terminal [MT0]     |        |  Station   |
           +---------------------+        +-----------+


    (b)    void


       +----------------+        +-------+   +-----------+
       |       V        |        |       |   |           |
    (c)|      DTE        +---------//--|  [MT2] +--//--|  Base     |
       |     [TE2]       |        |       |   |  Station   |
       +----------------+        +-------+   +-----------+


       +----------------+        +-------+   +-----------+
       |     V.24       |        |       |   |           |
       | and PCMCIA 2.1 |        |       |   |           |
    (d)|      DTE        +-------------//-|  [MT2] +-//-|  Base     |
       |     [TE2]       |        |       |   |  Station   |
       +----------------+        +-------+   +-----------+


    (e)    void


           +---------------------+        +-----------+
           |   Speech-only MS    |        |           |
    (f)    |                     +-----//--|  Base     |
           |       [MT0]         |        |  Station   |
           +---------------------+        +-----------+
```
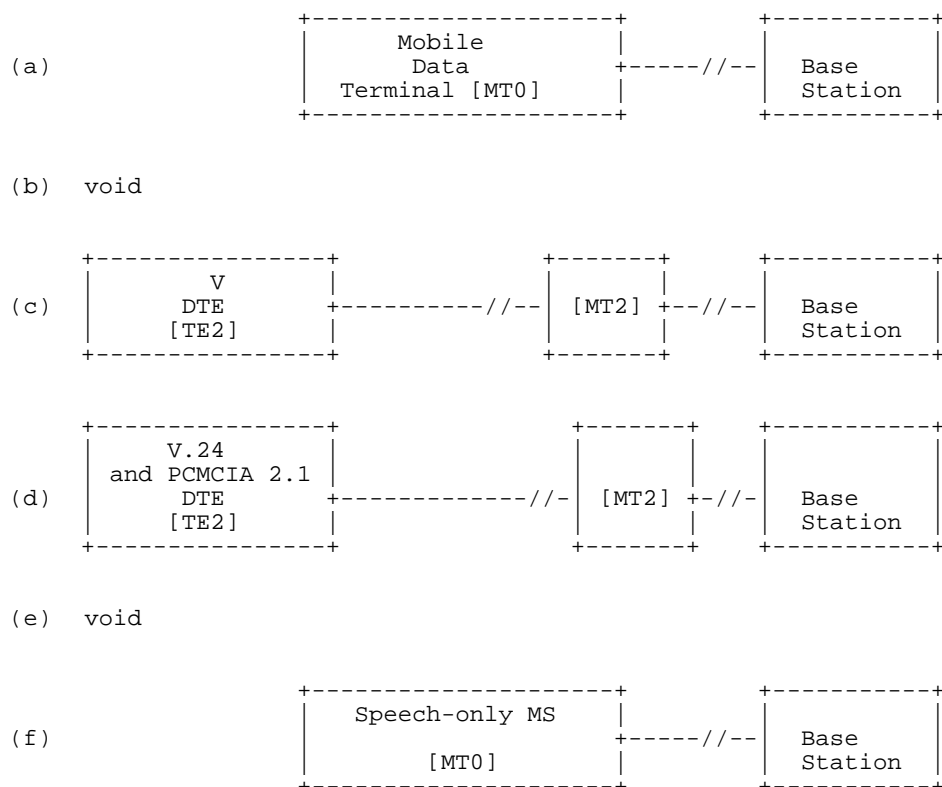
Figure 3: Examples of physical implementations

Annex A (informative):
Change history

Change history							
Date	**TSG #**	**TSG Doc.**	**CR**	**Rev**	**Subject/Comment**	**Old**	**New**
30.3.2000	CN#7	-	-	-	Transferred to 3GPP for R99 (from GSM 04.02 v7.0.0).		3.0.0
12-2000	NP-10	NP-000673	001	2	CR 24.002 on Adaptations for UMTS	3.0.0	3.1.0
03-2001	NP-11				TSG CN#11 decided to issue RELEASE 4 of the specification 3GPP TS 24.002	3.1.0	4.0.0
06-2002	NP-16				CN#16 decided to issue this TS also for Release 5. Additionally MCC made editorial and reference updates.	4.0.0	5.0.0
03-2003	NP-19	NP-030044	003	1	Removal of the S reference point within the MS	5.0.0	5.1.0
06-2003					Corrected the coverpage and some formatting,- MCC editorial.	5.1.0	5.1.1

History

Document history		
V5.0.0	June 2002	Publication
V5.1.0	March 2003	Publication (Withdrawn)
V5.1.1	June 2003	Publication