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Digital cellular telecommunications system (Phase 2+) (GSM); GSM Cordless Telephony System (CTS), Phase 1; CTS supervising system layer 3 specification (GSM 04.57 version 8.0.1 Release 1999)

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European Standard (Telecommunications series)

**Digital cellular telecommunications system (Phase 2+);
GSM Cordless Telephony System (CTS), Phase 1;
CTS supervising system layer 3 specification
(GSM 04.57 version 8.0.1 Release 1999)**

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ETSI

650 Route des Lucioles
F-06921 Sophia Antipolis Cedex - FRANCE

Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16

Siret N° 348 623 562 00017 - NAF 742 C
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Foreword

This European Standard (Telecommunications series) has been produced by ETSI Technical Committee Special Mobile Group (SMG).

The present document was submitted to One-step Approval with the ETSI number 301 407. For publication the number was changed to 302 407 because the number 301 407 is reserved and was allocated accidentally.

The present document specifies the procedures used at the CTS radio interface (Reference Point Um*, see GSM 03.56) for Call Control (CC), Mobility Management (MM) and Radio Resource (RR) management within the European digital cellular telecommunications system.

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

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- 8 GSM Phase 2+ Release 1999
- y the third digit is incremented when editorial only changes have been incorporated in the specification;
- x the second digit is incremented for all other types of changes, i.e. technical enhancements, corrections, updates, etc.

National transposition dates

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Date of withdrawal of any conflicting National Standard (dow):	30 April 2001

1 Scope

The present document specifies the procedures used at the CTS system interface with the supervision part i.e. the interface between the CTS-FP and the CTS-SN.

Only CTS regular supervising procedures are described; FMC management is not intended to be standardised.

The present document does not specify the transmission layer but only the layer 3.

When the notations for "further study" or "FS" or "FFS" are present in the present document they mean that the indicated text is not a normative portion of the present document.

The structured functions and procedures of this protocol and the relationship with other layers and entities are described in general terms in GSM 04.07.

1.1 Scope of the Technical Specification

The procedures currently described in the present document are for supervising management over the CTS-FP/CTS-SN interface.

1.2 Application to the interface structures

The layer 3 procedures apply to the interface structures defined in GSM 04.03. GSM 04.07 gives the general description of layer 3 including procedures, messages format and error handling.

1.3 Structure of layer 3 procedures

A building block method is used to describe the layer 3 procedures.

The basic building blocks are "elementary procedures" provided by the protocol control entities.

Complete layer 3 transactions consist of specific sequences of elementary procedures. The term "structured procedure" is used for these sequences.

1.4 Test procedures

Test procedures of the CTS / Fixed Network interface signalling are described in the GSM 11.56 series.

1.5 Transmission layer

The transmission layer is out of scope of the present document. One implementation could be a V.22bis modem with an HDLC based protocol.

1.6 Overview of control procedures

1.6.1 List of procedures

The following procedures are specified in the present document:

Section 4 specifies elementary procedures for CTS Supervising Management

- CTS-FP initialisation procedure (subclause 4.4.1)
- CTS-FP de-initialisation procedure (subclause 4.4.5)

- CTS enrolment procedure (subclause 4.4.2)
- CTS de-enrolment procedure (subclause 4.4.6)
- CTS operation data update procedure (subclause 4.4.3)
- CTS information request procedure (subclause 4.4.4)
- CTS FP authentication procedure (subclause 4.4.7)
- CTS MS authentication procedure (subclause 4.4.8)

The elementary procedures can be combined to form structured procedures. Examples of such structured procedures are given in section 5. This part of the Technical Specification is only provided for guidance to assist implementations.

Section 6 specifies actions to be taken on various error conditions and also provides rules to ensure compatibility with future enhancements of the protocol.

1.7 Applicability of implementations

The applicability of procedures of the present document for the fixed part is dependent on the services and functions which are to be supported by a fixed part.

2 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.
- A non-specific reference to an ETS shall also be taken to refer to later versions published as an EN with the same number.
- For this Release 1999 document, references to GSM documents are for Release 1999 versions (version 8.x.y).

- [1] GSM 01.02: "Digital cellular telecommunications system (Phase 2+); General description of a GSM Public Land Mobile Network (PLMN)".
- [2] GSM 01.04: "Digital cellular telecommunications system (Phase 2+); Abbreviations and acronyms".
- [3] GSM 02.02: "Digital cellular telecommunications system (Phase 2+); Bearer Services (BS) supported by a GSM Public Land Mobile Network (PLMN)".
- [4] GSM 02.03: "Digital cellular telecommunications system (Phase 2+); Teleservices supported by a GSM Public Land Mobile Network (PLMN)".
- [5] GSM 02.09: "Digital cellular telecommunications system (Phase 2+); Security aspects".
- [6] GSM 02.11: "Digital cellular telecommunications system (Phase 2+); Service accessibility".
- [7] GSM 02.17: "Digital cellular telecommunications system (Phase 2+); Subscriber identity modules Functional characteristics".
- [8] GSM 02.40: "Digital cellular telecommunications system (Phase 2+); Procedures for call progress indications".
- [9] GSM 03.01: "Digital cellular telecommunications system (Phase 2+); Network functions".

- [10] GSM 03.03: "Digital cellular telecommunications system (Phase 2+); Numbering, addressing and identification".
- [11] GSM 03.13: "Digital cellular telecommunications system (Phase 2+); Discontinuous Reception (DRX) in the GSM system".
- [12] GSM 03.14: "Digital cellular telecommunications system (Phase 2+); Support of Dual Tone Multi-Frequency signalling (DTMF) via the GSM system".
- [13] GSM 03.20: "Digital cellular telecommunications system (Phase 2+); Security related network functions".
- [14] GSM 03.22: "Digital cellular telecommunications system (Phase 2+); Functions related to Mobile Station (MS) in idle mode".
- [15] GSM 04.02: "Digital cellular telecommunications system (Phase 2+); GSM Public Land Mobile Network (PLMN) access reference configuration".
- [16] GSM 04.03: "Digital cellular telecommunications system (Phase 2+); Mobile Station - Base Station System (MS - BSS) interface Channel structures and access capabilities".
- [17] GSM 04.04: "Digital cellular telecommunications system (Phase 2+); layer 1 General requirements".
- [18] GSM 04.05: "Digital cellular telecommunications system (Phase 2+); Data Link (DL) layer General aspects".
- [19] GSM 04.06: "Digital cellular telecommunications system (Phase 2+); Mobile Station - Base Station System (MS - BSS) interface Data Link (DL) layer specification".
- [20] GSM 04.07: "Digital cellular telecommunications system (Phase 2+); Mobile radio interface signalling layer 3 General aspects".
- [21] GSM 04.10: "Digital cellular telecommunications system ; Mobile radio interface layer 3 Supplementary services specification General aspects".
- [22] GSM 04.11: "Digital cellular telecommunications system (Phase 2); Point-to-Point (PP) Short Message Service (SMS) support on mobile radio interface".
- [23] GSM 04.12: "Digital cellular telecommunications system (Phase 2+); Short Message Service Cell Broadcast (SMSCB) support on the mobile radio interface".
- [24] GSM 04.80: "Digital cellular telecommunications system (Phase 2+); Mobile radio interface layer 3 supplementary services specification Formats and coding".
- [25] GSM 04.81: "Digital cellular telecommunications system (Phase 2+); Line identification supplementary services - Stage 3".
- [26] GSM 04.82: "Digital cellular telecommunications system (Phase 2+); Call Forwarding (CF) supplementary services - Stage 3".
- [27] GSM 04.83: "Digital cellular telecommunications system (Phase 2+); Call Waiting (CW) and Call Hold (HOLD) supplementary services - Stage 3".
- [28] GSM 04.84: "Digital cellular telecommunications system (Phase 2+); MultiParty (MPTY) supplementary services - Stage 3".
- [29] GSM 04.85: "Digital cellular telecommunications system (Phase 2+); Closed User Group (CUG) supplementary services - Stage 3".
- [30] GSM 04.86: "Digital cellular telecommunications system (Phase 2+); Advice of Charge (AoC) supplementary services - Stage 3".
- [31] GSM 04.88: "Digital cellular telecommunications system (Phase 2+); Call Barring (CB) supplementary services - Stage 3".

- [32] GSM 05.02: "Digital cellular telecommunications system (Phase 2+); Multiplexing and multiple access on the radio path".
- [33] GSM 05.05: "Digital cellular telecommunications system (Phase 2+); Radio transmission and reception".
- [34] GSM 05.08: "Digital cellular telecommunications system (Phase 2+); Radio subsystem link control".
- [35] GSM 05.10: "Digital cellular telecommunications system (Phase 2+); Radio subsystem synchronization".
- [36] GSM 07.01: "Digital cellular telecommunications system (Phase 2+); General on Terminal Adaptation Functions (TAF) for Mobile Stations (MS)".
- [37] GSM 09.02: "Digital cellular telecommunications system (Phase 2+); Mobile Application Part (MAP) specification".
- [38] GSM 09.07: "Digital cellular telecommunications system (Phase 2+); General requirements on interworking between the Public Land Mobile Network (PLMN) and the Integrated Services Digital Network (ISDN) or Public Switched Telephone Network (PSTN)".
- [39] GSM 11.10: "Digital cellular telecommunications system (Phase 2+); Mobile Station (MS) conformity specification".
- [40] GSM 11.21: "Digital cellular telecommunications system (Phase 2); The GSM Base Station System (BSS) equipment specification".
- [41] ISO/IEC 646 (1991): "Information technology - ISO 7-bit coded character set for information interchange".
- [42] ISO/IEC 6429: "Information technology - Control functions for coded character sets".
- [43] ISO 8348 (1987): "Information processing systems - Data communications - Network service definition".
- [44] CCITT Recommendation E.163: "Numbering plan for the international telephone service".
- [45] CCITT Recommendation E.164: "Numbering plan for the ISDN era".
- [46] CCITT Recommendation E.212: "Identification plan for land mobile stations".
- [47] ITU-T Recommendation F.69 (1993): "Plan for telex destination codes".
- [48] CCITT Recommendation I.330: "ISDN numbering and addressing principles".
- [49] CCITT Recommendation I.440 (1989): "ISDN user-network interface data link layer - General aspects".
- [50] CCITT Recommendation I.450 (1989): "ISDN user-network interface layer 3 General aspects".
- [51] ITU-T Recommendation I.500 (1993): "General structure of the ISDN interworking recommendations".
- [52] CCITT Recommendation T.50: "International Alphabet No. 5".
- [53] CCITT Recommendation Q.931: ISDN user-network interface layer 3 specification for basic control".
- [54] CCITT Recommendation V.21: "300 bits per second duplex modem standardized for use in the general switched telephone network".
- [55] CCITT Recommendation V.22: "1200 bits per second duplex modem standardized for use in the general switched telephone network and on point-to-point 2-wire leased telephone-type circuits".

- [56] CCITT Recommendation V.22bis: "2400 bits per second duplex modem using the frequency division technique standardized for use on the general switched telephone network and on point-to-point 2-wire leased telephone-type circuits".
- [57] CCITT Recommendation V.23: "600/1200-baud modem standardized for use in the general switched telephone network".
- [58] CCITT Recommendation V.26ter: "2400 bits per second duplex modem using the echo cancellation technique standardized for use on the general switched telephone network and on point-to-point 2-wire leased telephone-type circuits".
- [59] CCITT Recommendation V.32: "A family of 2-wire, duplex modems operating at data signalling rates of up to 9600 bit/s for use on the general switched telephone network and on leased telephone-type circuits".
- [60] CCITT Recommendation V.110: "Support of data terminal equipments (DTEs) with V-Series interfaces by an integrated services digital network".
- [61] CCITT Recommendation V.120: "Support by an ISDN of data terminal equipment with V-Series type interfaces with provision for statistical multiplexing".
- [62] CCITT Recommendation X.21: "Interface between data terminal equipment (DTE) and data circuit-terminating equipment (DCE) for synchronous operation on public data networks".
- [63] CCITT Recommendation X.25: "Interface between data terminal equipment (DTE) and data circuit-terminating equipment (DCE) for terminals operating in the packet mode and connected to public data networks by dedicated circuit".
- [64] CCITT Recommendation X.28: "DTE/DCE interface for a start-stop mode data terminal equipment accessing the packet assembly/disassembly facility (PAD) in a public data network situated in the same country".
- [65] CCITT Recommendation X.30: "Support of X.21, X.21 bis and X.20 bis based data terminal equipments (DTEs) by an integrated services digital network (ISDN)".
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- [66] CCITT Recommendation X.31: "Support of packet mode terminal equipment by an ISDN".
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- [68] CCITT Recommendation X.75 (1988): "Packet-switched signalling system between public networks providing data transmission services".
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- [70] ETS 300 102-1: "Integrated Services Digital Network (ISDN); User-network interface layer 3 Specifications for basic call control".
- [71] ETS 300 102-2: "Integrated Services Digital Network (ISDN); User-network interface layer 3 Specifications for basic call control".
- [72] ISO/IEC10646: "Universal Multiple-Octet Coded Character Set (UCS)"; UCS2, 16 bit coding.
- [73] GSM 02.56: "Digital cellular telecommunications system (Phase 2+); GSM-CTS; Service Description; Stage 1".
- [74] GSM 03.56: "Digital cellular telecommunications system (Phase 2+); GSM-CTS; Service Description; Stage 2".
- [75] GSM 03.52: "Digital cellular telecommunications system (Phase 2+); GSM-CTS; Overall description of the CTS radio interface; Stage 2".
- [76] GSM 03.20 Annex E: "Digital cellular telecommunications system (Phase 2+); GSM-CTS; Security related network functions; Stage 2".

[77] GSM 04.56: "Digital cellular telecommunications system (Phase 2+); GSM-CTS;CTS radio interface layer 3 specification; Stage 3".

3 Definitions, abbreviations and Random values

3.1 Definitions

For the purposes of the present document, the following terms and definitions apply.

initialised Fixed Part: Fixed Part which have been supplied with the necessary data to provide CTS service on the CTS radio interface. The CTS-FP initialisation procedure is performed at the Fixed Part installation and can be performed whenever the Fixed Part have been de-initialised.

de-initialised Fixed Part: Fixed Part which does not contain the required data to offer CTS service. A de-initialised Fixed Part cannot offer any service.

enrolled Mobile Station: Mobile Station is said to be enrolled on a Fixed Part if it has exchanged some data with this Fixed Part enabling attachment (e.g.in order to perform outgoing calls).

de-enrolled Mobile Station: Mobile Station that is no more known by the Fixed Part.

CTS radio interface: Radio interface between the Mobile Station and the Fixed Part.

3.2 Abbreviations

Abbreviations used in the present document are listed in GSM 01.04.

3.3 Random values

In a number of places in the present document, it is mentioned that some value must take a "random" value, in a given range, or more generally with some statistical distribution.

It is required that there is a low probability that two equipments in the same conditions (including the case of two equipments of the same type from the same manufacturer) will choose or get the same value.

4 CTS supervising management procedures

4.1 General

CTS supervising management procedures include the functions related to the management of the CTS system by the CTS operator. These functions are based on:

- radio control: the control of the radio parameters used on the CTS radio interface;
- security control: including subscription checking, CTS authentication (the authentication of the CTS subscriber identity by the CTS Service Node and the authentication of the signature issued by the Service Node by the Fixed Part), GSM authentication (authentication of the Mobile Station by the GSM operator through the Service Node) and administrative data management.

All the CTS supervising procedures can only be performed if a CTS-FP/CTS-SN connection has been established between the fixed part and the service node. If no CTS-FP/CTS-SN connection is currently established, the CTS supervising layer has to initiate such establishment.

As in most cases, the CTS-SN has no means of addressing the CTS-FP, it is assumed that the CTS procedures can only be started by the fixed part. CTS procedures initiated by the Service Node follow a procedure started by the Fixed Part.

4.2 CTS-SPM procedures

All CTS-SPM procedures can only be initiated if a CTS-FP/CTS-SN connection is established.

The procedures initiated by the Fixed Part are:

- CTS-SPM initialisation procedure;
- CTS-SPM enrolment procedure;
- CTS-SPM de-enrolment indication procedure;
- CTS-SPM operation data update procedure.

The procedures initiated by the Service Node (following a procedure started by the Fixed Part) are:

- CTS-SPM de-initialisation procedure;
- CTS-SPM de-enrolment procedure;
- CTS-SPM FP authentication procedure;
- CTS-SPM MS authentication procedure;
- CTS-SPM signature mode setting procedure;
- CTS-SPM operation data inform procedure.

4.3 CTS-SPM states

STANDARD PREVIEW
(standards.iteh.ai)

4.3.1 CTS-SPM states at the Fixed Part

1. IDLE

<https://standards.iteh.ai/catalog/standards/sist/0849a7a1-cf65-405f-85ca-725126467627/sist-en-302-407-v8-0-1-2003>

The CTS-SPM state is not active.

2. WAIT FOR CTS-FP/CTS-SN CONNECTION

The CTS-SPM has requested the establishment of a CTS-FP/CTS-SN connection.

3. CTS-SPM CONNECTION ACTIVE

A CTS-SPM connection is active. Only one CTS-SPM connection can be active at a time.

4. CTS-SPM INITIALISATION INITIATED

The CTS-FP initialisation procedure has been started at the Fixed Part.

5. CTS-SPM ENROLMENT INITIATED

The enrolment procedure has been started at the Fixed Part.

6. CTS-SPM OPERATION DATA UPDATE INITIATED

The operation data update procedure has been started at the Fixed Part.

Only one CTS-SPM connection can be active at a time on the Fixed Part. Nevertheless, an active CTS-SPM connection does not preclude having active CTS-RR and CTS-MM active connection on the CTS radio interface.

4.3.2 CTS-SPM states at the Service Node

1. CTS-SPM DE-INITIALISATION INITIATED

The CTS-FP de-initialisation procedure has been started by the Service Node.