



# SLOVENSKI STANDARD SIST ETS 300 590 E6:2003

01-december-2003

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Digital cellular telecommunications system (Phase 2) (GSM); Mobile-services Switching Centre - Base Station System (MSC - BSS) interface; Layer 3 specification (GSM 08.08 version 4.12.1)

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Ta slovenski standard je istoveten z: **ETS 300 590 Edition 6**

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### **ICS:**

33.070.50	Globalni sistem za mobilno telekomunikacijo (GSM)	Global System for Mobile Communication (GSM)
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**E**UROPEAN  
**T**ELECOMMUNICATION  
**S**TANDARD

**ETS 300 590**

October 1998

Sixth Edition

Source: SMG

Reference: RE/SMG-030808PR5

ICS: 33.020

**Key words:** Digital cellular telecommunications system, Global System for Mobile communications (GSM)



**Digital cellular telecommunications system (Phase 2);  
Mobile-services Switching Centre - Base Station System  
(MSC - BSS) interface;  
Layer 3 specification  
(GSM 08.08 version 4.12.1)**

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## Foreword

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

This ETS defines the layer 3 specification for the Base Station System (BSS) to Mobile-services Switching Centre (MSC) interface.

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.

Transposition dates	
Date of adoption of this ETS:	23 October 1998
Date of latest announcement of this ETS (doa):	31 January 1999
Date of latest publication of new National Standard or endorsement of this ETS (dop/e):	31 July 1999
Date of withdrawal of any conflicting National Standard (dow):	31 July 1999

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## 1 Scope

This European Telecommunication Standard (ETS) specifies the layer 3 procedures used on the BSS to MSC interface for control of GSM services.

For the purposes of call control and mobility management, messages are not interpreted at the Base Station System (BSS) which acts as a relay function. These messages and procedures are documented in Technical Specification GSM 04.08, the only relevant issues covering these messages in this Technical Specification are those concerned with error conditions at the interface, and the headers that are required for the correct addressing of the messages. This is specified in more detail in Technical Specification GSM 08.06.

The functional split between MSC and BSS is defined in Technical Specification GSM 08.02 and states that the BSS is responsible for local radio resource allocation and in order to support this the required procedures between BSS and MSC are defined in detail in this Technical Specification.

Technical Specification GSM 08.02 also states that the BSS is responsible for the scheduling of all CCCH/BCCH messages and therefore some procedures for providing the BSS with the necessary information to be passed on these channels for individual calls (ie paging) are defined in this Technical Specification, but the scheduling is not discussed.

This interface and consequently these layer 3 procedures are designed to support BSSs providing one or more cells.

### 1.1 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): "Digital cellular telecommunications system (Phase 2); Abbreviations and acronyms".  
<https://standards.itec.int/catalogue/standards/sist/5218d931-7584-4cd6-ac33-56596e9da5da/sist-ets-300-590-e6-2003>
- [2] GSM 03.03 (ETS 300 523): "Digital cellular telecommunications system (Phase 2); Numbering, addressing and identification".
- [3] GSM 03.09 (ETS 300 527): "Digital cellular telecommunications system (Phase 2); Handover procedures".
- [4] GSM 04.08 (ETS 300 557): "Digital cellular telecommunications system (Phase 2); Mobile radio interface layer 3 specification".
- [5] GSM 04.21 (ETS 300 562): "Digital cellular telecommunications system (Phase 2); Rate adaption on the Mobile Station - Base Station System (MS - BSS) interface".
- [6] GSM 05.01 (ETS 300 573): "Digital cellular telecommunications system (Phase 2); Physical layer on the radio path General description".

- [7] GSM 05.02 (ETS 300 574): "Digital cellular telecommunications system (Phase 2); Multiplexing and multiple access on the radio path".
- [8] GSM 05.03 (ETS 300 575): "Digital cellular telecommunications system (Phase 2); Channel coding".
- [9] GSM 05.04 (ETS 300 576): "Digital cellular telecommunications system (Phase 2); Modulation".
- [10] GSM 05.05 (ETS 300 577): "Digital cellular telecommunications system (Phase 2); Radio transmission and reception".
- [11] GSM 05.08 (ETS 300 578): "Digital cellular telecommunications system (Phase 2); Radio subsystem link control".
- [12] GSM 05.90 (ETR 108): "Digital cellular telecommunications system (Phase 2); GSM Electro Magnetic Compatibility (EMC) considerations".
- [13] GSM 05.10 (ETS 300 579): "Digital cellular telecommunications system (Phase 2); Radio subsystem synchronisation".
- [14] GSM 08.02 (ETS 300 587-2): "Digital cellular telecommunications system (Phase 2); Base Station System - Mobile-services Switching Centre (BSS - MSC) interface Interface principles".
- [15] GSM 08.06 (ETS 300 589): "Digital cellular telecommunications system (Phase 2); Signalling transport mechanism specification for the Base Station System - Mobile-services Switching Centre (BSS - MSC) interface".
- [16] GSM 08.20 (ETS 300 591): "Digital cellular telecommunications system (Phase 2); Rate adaption on the Base Station System - Mobile-services Switching Centre (BSS - MSC) interface".
- [17] GSM 12.00 (pre-ETS 300 612-1): "Digital cellular telecommunications system (Phase 2); Objectives and structure of Network Management (NM)".
- [18] GSM 12.01 (ETS 300 612-2): "Digital cellular telecommunications system (Phase 2); Common aspects of GSM Network Management (NM)".
- [19] GSM 12.07 (ETS 300 612-3): "Digital cellular telecommunications system (Phase 2); Operations and performance management".
- [20] GSM 12.02 (ETS 300 613): "Digital cellular telecommunications system (Phase 2); Subscriber, Mobile Equipment (ME) and services data administration".
- [21] GSM 12.03 (ETS 300 614): "Digital cellular telecommunications system (Phase 2); Security management".
- [22] GSM 12.04 (ETS 300 615): "Digital cellular telecommunications system (Phase 2); Performance data measurements".
- [23] GSM 12.05 (ETS 300 616): "Digital cellular telecommunications system (Phase 2); Subscriber related event and call data".

- [24] GSM 12.06 (ETS 300 617): "Digital cellular telecommunications system (Phase 2); GSM Network change control".
- [25] GSM 12.10 (ETS 300 618): "Digital cellular telecommunications system (Phase 2); Maintenance provisions for operational integrity of Mobile Stations (MS)".
- [26] GSM 12.11 (ETS 300 619): "Digital cellular telecommunications system (Phase 2); Maintenance of the Base Station System (BSS)".
- [27] GSM 12.13 (ETS 300 620): "Digital cellular telecommunications system (Phase 2); Maintenance of the Mobile-services Switching Centre (MSC)".
- [28] GSM 12.14 (ETS 300 621): "Digital cellular telecommunications system (Phase 2); Maintenance of location registers".
- [29] GSM 12.20 (ETS 300 622): "Digital cellular telecommunications system (Phase 2); Network Management (NM) procedures and messages".
- [30] GSM 12.21 (ETS 300 623): "Digital cellular telecommunications system (Phase 2); Network Management (NM) procedures and message on the A-bis interface".
- [31] GSM 12.22 (ETS 300 624): "Digital cellular telecommunications system (Phase 2); Interworking of GSM Network Management (NM) procedures and messages at the Base Station Controller (BSC)".

## 1.2 Definitions and abbreviations

Abbreviations used in this specification are listed in GSM 01.04, see Clause 5 for Vocabulary.

## 2 Application to interface structures

The underlying transport mechanism defined to carry signalling information between the BSS and the MSC is the Message Transfer Part (MTP), and the Signalling Connection Control Part (SCCP) of Signalling System No.7.

The MTP and SCCP are used to support communication between the MSC and two conceptual entities within the BSS, these are:

- the BSS Operation and Maintenance Application Part (BSSOMAP);
- the BSS Application Part (BSSAP).

The BSS Application Part is split into two sub application parts, these are:

- the BSS Management Application Part (BSSMAP);
- the Direct Transfer Application Part (DTAP).

Distribution of messages between the two sub application parts is described in Technical Specification GSM 08.06.

Figure 1 is a diagrammatical representation of these conceptual entities. It should be noted that this is not intended to imply a particular implementation and is only for the purposes of specifying the interface.

Differentiation between BSSAP and BSSOMAP is by addressing mechanisms within the SCCP, using the subsystem number (see Technical Specification GSM 08.06).

## 2.1 The BSS Operation and Maintenance Application Part

If operation and maintenance messages are transferred by means of this interface then they shall use SCCP messages. The application protocol for the Operation and Maintenance Application Part is defined in the GSM 12 series Technical Specifications. The routing and addressing is provided by the SCCP and allows the MSC and the O&M centre to be addressed directly by the BSS using, for example, two E164 numbers. The operator may also use an X.25 connection for the transfer of O&M messages between the BSS and the OMC. This option is not further discussed in this Technical Specification.

## 2.2 The Direct Transfer Application Part

The Direct Transfer Application Part (DTAP) is used to transfer call control and mobility management messages between the MSC and the MS. The DTAP information in these messages is not interpreted by the BSS. Technical Specification GSM 08.06 contains more detail relating to the handling of DTAP messages at the BSS, the multiplexing of the messages onto the relevant signalling channels of the radio interface, and the use of the SCCP services.

Messages received from the MS are identified as DTAP by the Protocol Discriminator Information Element as described in Technical Specification GSM 04.08, except for Initial Layer 3 messages (see section 3.1.16). The majority of radio interface messages are transferred across the BSS MSC interface by the DTAP, the exceptions being messages belonging to the Radio Resource (RR) management protocol.

## 2.3 The BSS Management Application Part

The BSSMAP supports all of the procedures between the MSC and the BSS that require interpretation and processing of information related to single calls, and resource management.

Some of the BSSMAP procedures result in, or are triggered by, Radio Resource (RR) management messages defined in Technical Specification GSM 04.08. The BSSMAP procedures are described in section 3.

## 2.4 Handling of Abnormal Events Related to the BSSAP Header

The BSSAP header is specified in Technical Specification GSM 08.06. Several abnormal events may be detected by the receiver:

- use of a reserved value in the DLCI or discriminator;
- length octet with value zero;
- length octet with a value inconsistent with that indicated by the SCCP.

In these cases the receiver may send a BSSMAP CONFUSION message as specified in section 3.2.1. If so, depending on the error in the BSSAP header, the error pointer shall be set to one of the values reserved for the BSSAP header in section 3.2.2.32.

Spare bits in the BSSAP header shall not be checked by the receiving entity.

### 3 The BSS Management Application Part

#### 3.1 BSSMAP Procedures

This section describes the procedures used in the BSS Management Application Part. There are the following main procedures:

*	Assignment	fig 2
#	Blocking	fig 10
#	Resource indication	fig 12
#	Reset	fig 11
*	Handover required indication	fig 4
*	Handover resource allocation	fig 5
*	Handover execution	fig 3
#	Handover candidate enquiry	fig 13
*	Release	figs 6 and 7
#	Paging	fig 15
#	Flow control	fig 14
*	Classmark update	fig 9
*	Cipher mode control	fig 17
*	Trace invocation	
*	Initial MS message	
*	Queuing indication	
*	Data link control SAPI not equal to 0	fig 18
#	Reset circuit	

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These procedures are documented separately and are intended to be used by the operators/manufacturers to build up complete call sequences, in a flexible manner. Any sequences given where more than one procedure is shown concatenated are only for illustrative purposes.

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Each of the above procedures is qualified by either an asterisk (\*) or a hash symbol (#). The hash symbol (#) denotes a global procedure which concerns a complete cell or BSS, or specific terrestrial circuits. The asterisk symbol (\*) denotes a dedicated procedure which concerns a single dedicated radio resource on the radio interface.

Messages used to support global procedures are sent using the connectionless services of the SCCP.

Messages used to support dedicated procedures are sent using the connection oriented services of the SCCP, on the connection which has been set up to support that call or transaction. The establishment of SCCP connections is detailed in Technical Specification GSM 08.06.

In the following description of each procedure it is explicitly stated whether the procedure is global or not, and hence the type of SCCP service used to support the procedure is defined.

The handling of unknown terrestrial circuits is defined in section 3.1.19.6 and the procedures of section 3.1.19.6 take precedence over those of the rest of section 3.1. The procedures of the rest of section 3.1 assume that the terrestrial circuit is known by the entity concerned.