



**SLOVENSKI STANDARD**  
**SIST ETS 300 527 E1:2003**

**01-december-2003**

---

9 j fcdg ]'X][ ]HJb]'WV] b]'H'Y\_ca i b]\_UV]'g ]'g]ghYa 'fZJhU&L'È'nf c ]'b]'dcgrcd\_]  
fl GA '\$' '\$- Ł

European digital cellular telecommunications system (Phase 2); Handover procedures  
(GSM 03.09)

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

Ta slovenski standard je istoveten z: **ETS 300 527 Edition 1**  
<https://standards.iteh.ai/catalog/standards/sist/3c58a62d-7955-4918-b9d2-d0358379129c/sist-ets-300-527-e1-2003>

**ICS:**

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

**SIST ETS 300 527 E1:2003**

**en**

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

SIST ETS 300 527 E1:2003

<https://standards.iteh.ai/catalog/standards/sist/3c58a62d-7933-49f8-b9d2-d0358379129c/sist-ets-300-527-e1-2003>



**E**UROPEAN  
**T**ELECOMMUNICATION  
**S**TANDARD

**ETS 300 527**

February 1995

Source: ETSI TC-SMG

Reference: DE/SMG-030309P

ICS: 33.060.30

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

**iTeh STANDARD PREVIEW**  
**European digital cellular telecommunications system (Phase 2);**  
**Handover procedures**

<https://standards.iteh.ai/catalog/standards/sist/300-527-e1-2003>  
**(GSM 03.09)**  
<https://standards.iteh.ai/catalog/standards/sist/300-527-e1-2003>

**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

**Copyright Notification:** No part may be reproduced except as authorized by written permission. The copyright and the foregoing restriction extend to reproduction in all media.

© European Telecommunications Standards Institute 1995. All rights reserved.

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

[SIST ETS 300 527 E1:2003](https://standards.iteh.ai/catalog/standards/sist/3c58a62d-7933-49f8-b9d2-d0358379129c/sist-ets-300-527-e1-2003)

<https://standards.iteh.ai/catalog/standards/sist/3c58a62d-7933-49f8-b9d2-d0358379129c/sist-ets-300-527-e1-2003>

## Contents

Foreword .....	5
1 Scope.....	7
2 Normative references.....	7
3 Definitions and abbreviations .....	12
4 Role, functional composition of MSCs and interfaces for handover .....	13
4.1 MSC-A .....	13
4.1.1 Role of MSC-A.....	13
4.1.2 Functional composition of MSC-A and its interfaces for handover .....	13
4.2 MSC-B .....	16
4.2.1 Role of MSC-B.....	16
4.2.2 Functional composition of MSC-B and its interfaces for handover .....	16
5 Handover initiation conditions .....	18
6 General description of the procedures for intra - MSC handovers.....	18
6.1 Procedure for Intra-MSC Handovers.....	18
7 General description of the procedures for inter - MSC handovers.....	20
7.1 Basic handover procedure requiring a circuit connection between MSC-A and MSC-B.....	20
7.2 Basic handover procedure not requiring a circuit connection between MSC-A and MSC-B.....	22
7.3 Procedure for subsequent handover requiring a circuit connection between MSC-A and MSC-B ....	23
7.3.1 Description of subsequent handover procedure (i): MSC-B to MSC-A.....	24
7.3.2 Description of the subsequent handover procedure (ii): MSC-B to MSC-B' .....	25
7.4 Procedure for subsequent handover not requiring a circuit connection between MSC-A and MSC-B.....	26
7.4.1 Description of the subsequent handover procedure without circuit connection (i): MSC-B to MSC-A.....	27
7.4.2 Description of the subsequent handover procedure without circuit connection (ii): MSC-B to MSC-B' .....	27
8 Detailed procedures in MSC-A .....	29
8.1 BSS/MSC and MS/MSC procedures in MSC-A (functional unit 1).....	29
8.2 Call control procedures MSC-A (functional unit 2) .....	29
8.3 Handover control procedures MSC-A (functional unit 3).....	31
8.4 MAP procedures in MSC-A (functional unit 4) .....	32
8.5 Interworking between Handover control procedures and MAP procedures in MSC-A .....	32
8.6 Compatibility with GSM Phase 1.....	32
9 Detailed procedures in MSC-B .....	33
9.1 BSS/MSC (MS/BSS) procedures MSC-B (functional unit 1) .....	33
9.2 Call control procedures MSC-B (functional unit 2) .....	33
9.3 Handover control procedures MSC-B (functional unit 3).....	34
9.4 MAP procedures MSC-B (functional unit 4).....	35
9.5 Interworking between Handover control procedures and MAP procedures in MSC-B .....	35
9.6 Compatibility with GSM Phase 1.....	35
10 Subsequent channel assignment using a circuit connection between MSC-A and MSC-B.....	36
11 Directed retry handover .....	37

12	SDL diagrams .....	39
	History .....	84

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

[SIST ETS 300 527 E1:2003](https://standards.iteh.ai/catalog/standards/sist/3c58a62d-7933-49f8-b9d2-d0358379129c/sist-ets-300-527-e1-2003)

<https://standards.iteh.ai/catalog/standards/sist/3c58a62d-7933-49f8-b9d2-d0358379129c/sist-ets-300-527-e1-2003>

## 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) and is now submitted for publication.

This ETS defines the Handover procedures for the European digital cellular telecommunications system (Phase 2). This ETS corresponds to GSM Technical Specification (GSM-TS) GSM 03.09 version 4.5.1.

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).

Reference is also made within this ETS to GSM xx.xx. series. The specifications in the series can be identified, with their full title, within the normative reference Clause of this final draft 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-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.

## iTeh STANDARD PREVIEW (standards.iteh.ai)

[SIST ETS 300 527 E1:2003](https://standards.iteh.ai/catalog/standards/sist/3c58a62d-7933-49f8-b9d2-d0358379129c/sist-ets-300-527-e1-2003)

<https://standards.iteh.ai/catalog/standards/sist/3c58a62d-7933-49f8-b9d2-d0358379129c/sist-ets-300-527-e1-2003>

Blank page

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

[SIST ETS 300 527 E1:2003](https://standards.iteh.ai/catalog/standards/sist/3c58a62d-7933-49f8-b9d2-d0358379129c/sist-ets-300-527-e1-2003)

<https://standards.iteh.ai/catalog/standards/sist/3c58a62d-7933-49f8-b9d2-d0358379129c/sist-ets-300-527-e1-2003>



## 1 Scope

This Technical Specification contains a detailed description of the handover procedures to be used in GSM PLMNs. The purpose of the handover procedures, as described in this specification, are to ensure that the connection to the MS is maintained as it moves from one BSS area to another.

This specification considers the following two cases:

- i) Handover between Base Stations connected to the same MSC, this is termed an Intra-MSC handover.
- ii) Handover between Base Stations connected to different MSCs, this is termed an Inter-MSC handover. This category can be sub-divided into three further procedures:
  - a) the Basic Inter-MSC Handover procedure, where the MS is handed over from a controlling MSC (MSC-A) to another MSC (MSC-B);
  - b) the Subsequent Inter-MSC Handover procedure, where the MS is handed over from MSC-B to a third MSC (MSC-B');
  - c) the Subsequent Inter-MSC handback, where the MS is handed back from MSC-B to MSC-A.

In both cases i) and ii) the same procedures as defined in the TS GSM 08.08 and the TS GSM 04.08 shall be used on the A-interface and on the Radio Interface, respectively. In case ii) the handover procedures shall transport the A-interface messages between MSC-A and MSC-B described in the Mobile Application Part (MAP), Technical Specification GSM 09.02. The split in functionality between the BSS and MSC is described in the GSM 08 series of Technical Specifications.

The interworking between the GSM 09.02 protocol and the GSM 08.08 protocol is described in the GSM 09.10 Technical Specification.

Handovers which take place on the same MSC are termed Intra-MSC handovers; this includes both Inter-BSS and Intra-BSS handovers.

This technical specification also covers the requirements for directed retry and the handover without a circuit connection between MSC-A and MSC-B. This technical specification does not consider the case of handovers between radio channels on the same BSS (Intra-BSS handover) or the handover of packet radio services.

Inter-MSC hand-over imposes a few limitations on the system. After inter-MSC hand-over:

- call re-establishment is not supported.

The list of GSM 08.08 features supported during and after Inter-MSC handover is given in TS GSM 09.08.

In the Inter-MSC handover case, the interworking between a Phase 1 BSSMAP protocol possibly used by one MSC and the Phase 2 BSSMAP protocol used in the Phase 2 MAP protocol on the E-interface is performed by this MSC.

**NOTE:** The message primitive names used in the SDL diagrams and message flows in this technical specification do not represent the actual messages specified in the GSM 04 and GSM 08 series or the services specified in the GSM 09 series of technical specifications. The primitive names are only intended to be indicative of their use in this document.

## 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 04.01 (ETS 300 550): "European digital cellular telecommunications system (Phase 2); Mobile Station - Base Station System (MS - BSS) interface General aspects and principles".
- [3] GSM 04.02 (ETS 300 551): "European digital cellular telecommunications system (Phase 2); GSM Public Land Mobile Network (PLMN) access reference configuration".
- [4] GSM 04.03 (ETS 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 (ETS 300 553): "European digital cellular telecommunications system (Phase 2); layer 1 General requirements".
- [6] GSM 04.05 (ETS 300 554): "European digital cellular telecommunications system (Phase 2); Data Link (DL) layer General aspects".
- [7] GSM 04.06 (ETS 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 (ETS 300 556): "European digital cellular telecommunications system (Phase 2); Mobile radio interface signalling layer 3 General aspects".
- [9] GSM 04.08 (ETS 300 557): "European digital cellular telecommunications system (Phase 2); Mobile radio interface layer 3 specification".
- [10] GSM 04.10 (ETS 300 558): "European digital cellular telecommunications system (Phase 2); Mobile radio interface layer 3 Supplementary services specification General aspects".
- [11] GSM 04.11 (ETS 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 (ETS 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 (ETS 300 561): "European digital cellular telecommunications system (Phase 2); Performance requirements on mobile radio interface".
- [14] GSM 04.21 (ETS 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 (ETS 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 (ETS 300 564): "European digital cellular telecommunications system (Phase 2); Mobile radio interface layer 3 supplementary services specification Formats and coding".
- [17] GSM 04.81 (ETS 300 565): "European digital cellular telecommunications system (Phase 2); Line identification supplementary services - Stage 3".
- [18] GSM 04.82 (ETS 300 566): "European digital cellular telecommunications system (Phase 2); Call Forwarding (CF) supplementary services - Stage 3".
- [19] GSM 04.83 (ETS 300 567): "European digital cellular telecommunications system (Phase 2); Call Waiting (CW) and Call Hold (HOLD) supplementary services - Stage 3".

- [20] GSM 04.84 (ETS 300 568): "European digital cellular telecommunications system (Phase 2); MultiParty (MPTY) supplementary services - Stage 3".
- [21] GSM 04.85 (ETS 300 569): "European digital cellular telecommunications system (Phase 2); Closed User Group (CUG) supplementary services - Stage 3".
- [22] GSM 04.86 (ETS 300 570): "European digital cellular telecommunications system (Phase 2); Advice of Charge (AoC) supplementary services - Stage 3".
- [23] GSM 04.88 (ETS 300 571): "European digital cellular telecommunications system (Phase 2); Call Barring (CB) supplementary services - Stage 3".
- [24] GSM 04.90 (ETS 300 572): "European digital cellular telecommunications system (Phase 2); Unstructured supplementary services operation - Stage 3".
- [25] GSM 05.01 (ETS 300 573): "European digital cellular telecommunications system (Phase 2); Physical layer on the radio path General description".
- [26] GSM 05.02 (ETS 300 574): "European digital cellular telecommunications system (Phase 2); Multiplexing and multiple access on the radio path".
- [27] GSM 05.03 (ETS 300 575): "European digital cellular telecommunications system (Phase 2); Channel coding".
- [28] GSM 05.04 (ETS 300 576): "European digital cellular telecommunications system (Phase 2); Modulation".
- [29] GSM 05.05 (ETS 300 577): "European digital cellular telecommunications system (Phase 2); Radio transmission and reception".
- [30] GSM 05.08 (ETS 300 578): "European digital cellular telecommunications system (Phase 2); Radio subsystem link control".
- [31] GSM 05.10 (ETS 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 08.01 (ETS 300 587-1): "European digital cellular telecommunications system (Phase 2); Base Station System - Mobile services Switching Centre (BSS - MSC) interface General aspects".
- [34] GSM 08.02 (ETS 300 587-2): "European digital cellular telecommunications system (Phase 2); Base Station System - Mobile-services Switching Centre (BSS - MSC) interface Interface principles".
- [35] GSM 08.04 (ETS 300 588): "European digital cellular telecommunications system (Phase 1); Base Station System - Mobile-services Switching Centre (BSS - MSC) interface Layer 1 specification".
- [36] GSM 08.06 (ETS 300 589): "European digital cellular telecommunications system (Phase 2); Signalling transport mechanism specification for the Base Station System - Mobile-services Switching Centre (BSS - MSC) interface".
- [37] GSM 08.08 (ETS 300 590): "European digital cellular telecommunications system (Phase 2); Mobile Switching Centre - Base Station System (MSC - BSS) interface Layer 3 specification".

- [38] GSM 08.20 (ETS 300 591): "European digital cellular telecommunications system (Phase 2); Rate adaption on the Base Station System - Mobile-services Switching Centre (BSS - MSC) interface".
- [39] GSM 08.51 (ETS 300 592): "European digital cellular telecommunications system (Phase 2); Base Station Controller - Base Transceiver Station (BSC - BTS) interface General aspects".
- [40] GSM 08.52 (ETS 300 593): "European digital cellular telecommunications system (Phase 2); Base Station Controller - Base Transceiver Station (BSC - BTS) interface Interface principles".
- [41] GSM 08.54 (ETS 300 594): "European digital cellular telecommunications system (Phase 2); Base Station Controller - Base Transceiver Station (BSC - BTS) interface Layer 1 structure of physical circuits".
- [42] GSM 08.56 (ETS 300 595): "European digital cellular telecommunications system (Phase 2); Base Station Controller - Base Transceiver Station (BSC - BTS) interface Layer 2 specification".
- [43] GSM 08.58 (ETS 300 596): "European digital cellular telecommunications system (Phase 2); Base Station Controller - Base Transceiver Station (BSC - BTS) interface Layer 3 specification".
- [44] GSM 08.60 (ETS 300 597): "European digital cellular telecommunications system (Phase 2); Inband control of remote transcoders and rate adaptors".
- [45] GSM 08.61 (ETS 300 598): "European digital cellular telecommunications system (Phase 2); Inband control of remote transcoders and rate adaptors (half rate)".
- [46] GSM 09.01 (ETR 109): "European digital cellular telecommunications system (Phase 2); General network interworking scenarios".  
<https://standards.iteh.ai/catalog/standards/sist/5c58a62d-7933-49f8-b9d2-d0358379129c/sist-ets-300-527-e1-2003>
- [47] GSM 09.02 (ETS 300 599): "European digital cellular telecommunications system (Phase 2); Mobile Application Part (MAP) specification".
- [48] GSM 09.03 (ETS 300 600): "European digital cellular telecommunications system (Phase 2); Signalling requirements on interworking between the Integrated Services Digital Network (ISDN) or Public Switched Telephone Network (PSTN) and the Public Land Mobile Network (PLMN)".
- [49] GSM 09.04 (ETS 300 601): "European digital cellular telecommunications system (Phase 2); Interworking between the Public Land Mobile Network (PLMN) and the Circuit Switched Public Data Network (CSPDN)".
- [50] GSM 09.05 (ETS 300 602): "European digital cellular telecommunications system (Phase 2); Interworking between the Public Land Mobile Network (PLMN) and the Packet Switched Public Data Network (PSPDN) for Packet Assembly/Disassembly facility (PAD) access".
- [51] GSM 09.06 (ETS 300 603): "European digital cellular telecommunications system (Phase 2); Interworking between a Public Land Mobile Network (PLMN) and a Packet Switched Public Data Network/Integrated Services Digital Network (PSPDN/ISDN) for the support of packet switched data transmission services".
- [52] GSM 09.07 (ETS 300 604): "European 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)".

- [53] GSM 09.08 (ETS 300 626): "European digital cellular telecommunications system (Phase 2); Application of the Base Station System Application Part (BSSAP) on the E-interface"
- [54] GSM 09.10 (ETS 300 605): "European digital cellular telecommunications system (Phase 2); Information element mapping between Mobile Station - Base Station System and BSS - Mobile-services Switching Centre (MS - BSS - MSC) Signalling procedures and the Mobile Application Part (MAP)"
- [55] GSM 09.11 (ETS 300 606): "European digital cellular telecommunications system (Phase 2); Signalling interworking for supplementary services".
- [56] GSM 09.90 (ETR 111): "European digital cellular telecommunications system (Phase 2); Interworking between Phase 1 infrastructure and Phase 2 Mobile Stations (MS)".
- [57] CCITT Recommendation Q.118: "Special release arrangements".

## iTeh STANDARD PREVIEW (standards.iteh.ai)

[SIST ETS 300 527 E1:2003](https://standards.iteh.ai/catalog/standards/sist/3c58a62d-7933-49f8-b9d2-d0358379129c/sist-ets-300-527-e1-2003)

<https://standards.iteh.ai/catalog/standards/sist/3c58a62d-7933-49f8-b9d2-d0358379129c/sist-ets-300-527-e1-2003>

### 3 Definitions and abbreviations

For the purpose of this specification, the following definitions and abbreviations apply:

BSS	Base Station System
BTS	Base Transceiver Station
BSC	Base Station Controller
ISC	International Switching Centre
MS	Mobile Station
MSC	Mobile Services Switching Centre
BSS-A	The BSS from which the MS is being handed over
BSS-B	The BSS to which the MS is being handed over
MSC-A	The controlling MSC on which the call was originally established
MSC-B	The MSC to which the MS is handed over in a Basic Handover
MSC-B'	The MSC to which the MS is handed over in a Subsequent Handover

Other abbreviations used in the GSM specifications are listed in GSM 01.04.

**STANDARD PREVIEW**  
**(standards.iteh.ai)**

[SIST ETS 300 527 E1:2003](https://standards.iteh.ai/catalog/standards/sist/3c58a62d-7933-49f8-b9d2-d0358379129c/sist-ets-300-527-e1-2003)

<https://standards.iteh.ai/catalog/standards/sist/3c58a62d-7933-49f8-b9d2-d0358379129c/sist-ets-300-527-e1-2003>

## 4 Role, functional composition of MSCs and interfaces for handover

### 4.1 MSC-A

#### 4.1.1 Role of MSC-A

In the Intra-MSC handover case, the MSC-A (simply termed MSC) controls the call, the mobility management and the radio resources before, during and after an Intra-MSC handover. When BSSAP procedures have to be performed, they are initiated and driven by MSC-A.

In the Inter-MSC handover case, MSC-A is the MSC which controls the call and the mobility management of the Mobile during the call, before, during and after a basic or subsequent handover. When BSSAP procedures related to dedicated resources have to be performed towards the MS, they are initiated and driven by MSC-A. The MSC-A - MSC-B interface works as a MSC - BSS interface for a subset of BSSMAP procedures. These BSSMAP procedures, described in TS GSM 09.08 are only those related to dedicated resources. The DTAP signalling is relayed transparently by MSC-B between MSC-A and the MS.

During a basic handover, MSC-A initiates and controls all the handover procedure, from its initiation (reception of Handover Required from BSS-A on A-interface) until its completion (reception of Handover Complete from MSC-B on E-interface).

During a subsequent handover back to MSC-A, MSC-A acts as a BSS towards MSC-B, which controls the handover procedure until the termination in MSC-A of the handover radio resources allocation (sending of the Handover Request Acknowledge to MSC-B from MSC-A). Then all handover related messages shall terminate at MSC-A (e.g. Handover Detect/Complete from BSS-B, Handover Failure from BSS-A).

During a subsequent handover to a third MSC, MSC-A works towards MSC-B' as described above in the basic handover paragraph and towards MSC-B as described above in subsequent handover paragraph.

#### 4.1.2 Functional composition of MSC-A and its interfaces for handover

SIST ETS 300 527 E1:2003

In order to simplify the description of the handover procedures, the controlling MSC (MSC-A) can be considered to be composed of five functional units, as shown in figure 1.

##### Signalling functions

- 1) BSC/MSC (MS/BSC) Procedures MSC-A. This unit is used to control the signalling between the MSC, BSC and MS. Interface A' is the connection to the old BSC and interface A'' is the connection to the new BSC, when an Intra-MSC handover takes place. Interface x represents the interworking connection to the Handover Control Procedures MSC-A.
- 2) Call Control Procedures MSC-A. This unit is used to control the call. Interface B' is used for normal call control procedures. When a Basic handover from MSC-A to MSC-B is to be performed then interface B'' is employed to provide a signalling and call control connection to MSC-B. If a Subsequent handover to MSC-B' is to be performed then interface B''' is used.
- 3) Handover Control Procedures MSC-A. This unit provides both the overall control of the handover procedure and interworking between the internal interfaces (x, y and z).
- 4) MAP Procedures MSC-A. This unit is responsible for controlling the exchange of MAP messages between MSCs during an Inter-MSC handover. This unit communicates with the Handover Control Procedures MSC-A via interface z.

##### Switching functions

- 5) Switch and Handover Device MSC-A This unit is responsible for connecting the new path into the network via interface B'. The handover device interconnections are illustrated in figure 2.