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Specification

**GEO-Mobile Radio Interface Specifications;
Part 3: Network specifications;
Sub-part 1: Network Functions;
GMR-2 03.001**



Reference

DTS/SES-002-03001

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IPRs:

Project	Company	Title	Country of Origin	Patent n°	Countries Applicable
TS 101 377 V1.1.1	Digital Voice Systems Inc		US	US 5,715,365	US
TS 101 377 V1.1.1	Digital Voice Systems Inc		US	US 5,754,974	US
TS 101 377 V1.1.1	Digital Voice Systems Inc		US	US 5,226,084	US
TS 101 377 V1.1.1	Digital Voice Systems Inc		US	US 5,701,390	US
TS 101 377 V1.1.1	Digital Voice Systems Inc		US	US 5,826,222	US

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Project	Company	Title	Country of Origin	Patent n°	Countries Applicable
TS 101 377 V1.1.1	Ericsson Mobile Communication	Improvements in, or in relation to, equalisers	GB	GB 2 215 567	GB
TS 101 377 V1.1.1	Ericsson Mobile Communication	Power Booster	GB	GB 2 251 768	GB
TS 101 377 V1.1.1	Ericsson Mobile Communication	Receiver Gain	GB	GB 2 233 846	GB
TS 101 377 V1.1.1	Ericsson Mobile Communication	Transmitter Power Control for Radio Telephone System	GB	GB 2 233 517	GB

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Project	Company	Title	Country of Origin	Patent n°	Countries Applicable
TS 101 377 V1.1.1	Hughes Network Systems		US	Pending	US

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Project	Company	Title	Country of Origin	Patent n°	Countries Applicable
TS 101 377 V1.1.1	Lockheed Martin Global Telecommunic. Inc	2.4-to-3 Kbps Rate Adaptation Apparatus for Use in Narrowband Data and Facsimile Communication Systems	US	US 6,108,348	US
TS 101 377 V1.1.1	Lockheed Martin Global Telecommunic. Inc	Cellular Spacecraft TDMA Communications System with Call Interrupt Coding System for Maximizing Traffic Throughput Cellular Spacecraft TDMA Communications System with Call Interrupt Coding System for Maximizing Traffic Throughput	US	US 5,717,686	US
TS 101 377 V1.1.1	Lockheed Martin Global Telecommunic. Inc	Enhanced Access Burst for Random Access Channels in TDMA Mobile Satellite System	US	US 5,875,182	
TS 101 377 V1.1.1	Lockheed Martin Global Telecommunic. Inc	Spacecraft Cellular Communication System	US	US 5,974,314	US
TS 101 377 V1.1.1	Lockheed Martin Global Telecommunic. Inc	Spacecraft Cellular Communication System	US	US 5,974,315	US
TS 101 377 V1.1.1	Lockheed Martin Global Telecommunic. Inc	Spacecraft Cellular Communication System with Mutual Offset High-argin Forward Control Signals	US	US 6,072,985	US
TS 101 377 V1.1.1	Lockheed Martin Global Telecommunic. Inc	Spacecraft Cellular Communication System with Spot Beam Pairing for Reduced Updates	US	US 6,118,998	US

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Foreword

This Technical Specification (TS) has been produced by ETSI Technical Committee Satellite Earth Stations and Systems (SES).

The contents of the present document are subject to continuing work within TC-SES and may change following formal TC-SES approval. Should TC-SES 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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where:

- the third digit (n) is incremented when editorial only changes have been incorporated in the specification;
- the second digit (m) is incremented for all other types of changes, i.e. technical enhancements, corrections, updates, etc.

The present document is part 3, sub-part 1 of a multi-part deliverable covering the GEO-Mobile Radio Interface Specifications, as identified below:

Part 1: "General specifications";

Part 2: "Service specifications";

Part 3: "Network specifications";

Sub-part 1: "Network Functions; GMR-2 03.001";

Sub-part 2: "Network Architecture; GMR-2 03.002";

Sub-part 3: "Numbering, Addressing and Identification; GMR-2 03.003";

Sub-part 4: "Restoration Procedures; GMR-2 03.007";

Sub-part 5: "Organization of Subscriber Data; GMR-2 03.008";

Sub-part 6: "Handover Procedures; GMR-2 03.009";

Sub-part 7: "Technical Realization of Short Message Service (SMES) Point-to-Point; GMR-2 03.040";

Sub-part 8: "Location Registration Procedures; GMR-2 03.012";

Sub-part 9: "Discontinuous Reception (DRX) in the GMR-2 System; GMR-2 03.013";

Sub-part 10: "Security Related Network Functions; GMR-2 03.020";

Sub-part 11: "Functions Related to Mobile Earth Station (MES) in idle Mode; GMR-2 03.022";

Sub-part 12: "Technical Realization of Facsimile Group 3 Transparent; GMR-2 03.045";

Sub-part 13: "Transmission Planning Aspects of the Speech Service in the Public Satellite Mobile Network (PSMN) system; GMR-2 03.050";

Sub-part 14: "Call Waiting (CW) and Call Hold (HOLD) Supplementary Services - Stage 2; GMR-2 03.083";

Sub-part 15: "Multiparty Supplementary Services; GMR-2 03.084";

Sub-part 16: "Technical Realization of Operator Determined Barring; GMR-2 03.015";

Sub-part 17: "Call Barring (CB) Supplementary Services - Stage 2; GMR-2 03.088";

Part 4: "Radio interface protocol specifications";

Part 5: "Radio interface physical layer specifications";

Part 6: "Speech coding specifications";

Part 7: "Terminal adaptor specifications".

Introduction

GMR stands for GEO (Geostationary Earth Orbit) Mobile Radio interface, which is used for mobile satellite services (MSS) utilizing geostationary satellite(s). GMR is derived from the terrestrial digital cellular standard GSM and supports access to GSM core networks.

Due to the differences between terrestrial and satellite channels, some modifications to the GSM standard are necessary. Some GSM specifications are directly applicable, whereas others are applicable with modifications. Similarly, some GSM specifications do not apply, while some GMR specifications have no corresponding GSM specification.

Since GMR is derived from GSM, the organization of the GMR specifications closely follows that of GSM. The GMR numbers have been designed to correspond to the GSM numbering system. All GMR specifications are allocated a unique GMR number as follows:

GMR-n xx.zyy

where:

xx.0yy ($z=0$) is used for GMR specifications that have a corresponding GSM specification. In this case, the numbers xx and yy correspond to the GSM numbering scheme.

xx.2yy ($z=2$) is used for GMR specifications that do not correspond to a GSM specification. In this case, only the number xx corresponds to the GSM numbering scheme and the number yy is allocated by GMR.

n denotes the first ($n=1$) or second ($n=2$) family of GMR specifications.

A GMR system is defined by the combination of a family of GMR specifications and GSM specifications as follows:

- If a GMR specification exists it takes precedence over the corresponding GSM specification (if any). This precedence rule applies to any references in the corresponding GSM specifications.

NOTE: Any references to GSM specifications within the GMR specifications are not subject to this precedence rule. For example, a GMR specification may contain specific references to the corresponding GSM specification.

- If a GMR specification does not exist the corresponding GSM specification may or may not apply. The applicability of the GSM specifications are defined in GMR-n 01.201.

1 Scope

The present document defines network functions which are necessary to support services and facilities provided by Public Satellite Mobile Networks (PSMN). A PSMN equates to the GSM Public Land Mobile Network (PLMN) and includes the link from the GMR-2 system Gateway(s) to the core network. A summary of the network functions is given in table 1 together with an indication as to whether the network must support the function. The table also indicates whether or not a function requires internetworking signalling between PSMNs, i.e. use of Mobile Application Part as defined in GSM 09.02 [23].

All functions require signalling on the radio path as specified in GMR-2 04.008 [21].

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 and/or edition number or version number) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies.

- [1] GMR-2 01.004 (ETSI TS 101 377-1-1): "GEO-Mobile Radio Interface Specifications; Part 1: General specifications; Sub-part 1: Abbreviations and Acronyms".
- [2] GMR-2 02.004 (ETSI TS 101 377-2-2): "GEO-Mobile Radio Interface Specifications; Part 2: Service specifications; Sub-part 2: General on Supplementary Services".
- [3] GMR-2 02.009 (ETSI TS 101 377-2-3): "GEO-Mobile Radio Interface Specifications; Part 2: Service specifications; Sub-part 3: Security Aspects".
- [4] GMR-2 03.002 (ETSI TS 101 377-3-2): "GEO-Mobile Radio Interface Specifications; Part 3: Network specifications; Sub-part 2: Network Architecture".
- [5] GMR-2 03.003 (ETSI TS 101 377-3-3): "GEO-Mobile Radio Interface Specifications; Part 3: Network specifications; Sub-part 3: Numbering, Addressing and Identification".
- [6] GMR-2 03.007 (ETSI TS 101 377-3-4): "GEO-Mobile Radio Interface Specifications; Part 3: Network specifications; Sub-part 4: Restoration Procedures".
- [7] GMR-2 03.008 (ETSI TS 101 377-3-5): "GEO-Mobile Radio Interface Specifications; Part 3: Network specifications; Sub-part 5: Organization of Subscriber Data".
- [8] GMR-2 03.012 (ETSI TS 101 377-3-8): "GEO-Mobile Radio Interface Specifications; Part 3: Network specifications; Sub-part 8: Location Registration Procedures".
- [9] GMR-2 03.013 (ETSI TS 101 377-3-9): "GEO-Mobile Radio Interface Specifications; Part 3: Network specifications; Sub-part 9: Discontinuous Reception (DRX) in the GMR-2 System".
- [10] GSM 03.14 (ETSI ETS 300 532): "European digital cellular telecommunications system (Phase 2); Support of Dual Tone Multi-Frequency signalling (DTMF) via the GSM system" (V4.1.1).
- [11] GMR-2 03.020 (ETSI TS 101 377-3-10): "GEO-Mobile Radio Interface Specifications; Part 3: Network specifications; Sub-part 10: Security related Network Functions".
- [12] GMR-2 03.022 (ETSI TS 101 377-3-11): "GEO-Mobile Radio Interface Specifications; Part 3: Network specifications; Sub-part 11: Functions Related to Mobile Earth Station (MES) in idle Mode".

- [13] GSM 03.40 (ETSI ETS 300 536): "Digital cellular telecommunications system (Phase 2); Technical realization of Short Message Service (SMS) Point-to-Point (PP) (V4.13.0)".
- [14] GSM 03.81 (ETSI ETS 300 542): "Digital cellular telecommunications system (Phase 2); Line identification supplementary services; Stage 2" (V4.8.1).
- [15] GSM 03.82 (ETSI ETS 300 543): "Digital cellular telecommunications system (Phase 2); Call Forwarding (CF) supplementary services; Stage 2" (V4.8.1).
- [16] GMR-2 03.083 (ETSI TS 101 377-3-14): "GEO-Mobile Radio Interface Specifications; Part 3: Network specifications; Sub-part 14: Call Waiting (CW) and Call Hold (HOLD) Supplementary Services - Stage 2".
- [17] GMR-2 03.084 (ETSI TS 101 377-3-15): "GEO-Mobile Radio Interface Specifications; Part 3: Network specifications; Sub-part 15: Multiparty Supplementary Services".
- [18] GSM 03.85 (ETSI ETS 300 546): "Digital cellular telecommunications system (Phase 2); Closed User Group (CUG) supplementary services; Stage 2" (V4.2.1).
- [19] GSM 03.86 (ETSI ETS 300 547): "European digital cellular telecommunications system (Phase 2); Advice of Charge (AoC) supplementary services; Stage 2" (V4.6.1).
- [20] GSM 03.88 (ETSI ETS 300 548): "European digital cellular telecommunications system (Phase 2); Call Barring (CB) supplementary services; Stage 2" (V4.6.1).
- [21] GMR-2 04.008 (ETSI TS 101 377-4-7): "GEO-Mobile Radio Interface Specifications; Part 4: Radio interface protocol specifications; Sub-part 7: Mobile radio interface Layer 3 Specifications".
- [22] GMR-2 05.008 (ETSI TS 101 377-5-6): "GEO-Mobile Radio Interface Specifications; Part 5: Radio interface physical layer specifications; Sub-part 6: Radio Subsystem Link Control".
- [23] GSM 09.02 (ETSI ETS 300 599): "European digital cellular telecommunications system (Phase 2); Mobile Application Part (MAP) specification" (V4.19.1).
- [24] GSM 12.00 (ETSI ETS 300 612-1): "Digital cellular telecommunications system (Phase 2); Network Management (NM); Part 1: Objectives and structure of network management" (V4.6.1).
- [25] GSM 12.02 (ETSI ETS 300 613): "Digital cellular telecommunications system (Phase 2); Subscriber, Mobile Equipment (ME) and services data administration" (V4.6.1).
- [26] GSM 12.03 (ETSI ETS 300 614): "Digital cellular telecommunications system (Phase 2); Security management" (V4.2.1).
- [27] GSM 12.04 (ETSI ETS 300 615): "Digital cellular telecommunications system (Phase 2); Performance data measurements" (V4.3.1).
- [28] GSM 12.05 (ETSI ETS 300 616): "Digital cellular telecommunications system (Phase 2); Event and call data" (V4.3.1).
- [29] GSM 12.06 (ETSI ETS 300 627): "Digital cellular telecommunications system (Phase 2); GSM network configuration management" (V4.1.1).
- [30] GSM 12.07 (ETSI ETS 300 612-3): "European digital cellular telecommunications system (Phase 2); operations and performance management" (Withdrawn).
- [31] GSM 12.10 (ETSI ETS 300 618): "European digital cellular telecommunications system (Phase 2); Maintenance provisions for operational integrity of Mobile Stations (MS)" (Withdrawn).
- [32] GSM 12.11 (ETSI EN 301 251): "Digital cellular telecommunications system (Phase 2); Fault management of the Base Station System (BSS)" (V4.2.0).
- [33] GSM 12.13 (ETSI ETS 300 620): "European digital cellular telecommunications system (Phase 2); Maintenance of the Mobile-services Switching Centre (MSC)" (Withdrawn).

- [34] GSM 12.14 (ETSI ETS 300 621): "European digital cellular telecommunications system (Phase 2); Maintenance of location registers".
- [35] GSM 12.20 (ETSI ETS 300 622): "Digital cellular telecommunications system (Phase 2); Base Station System (BSS) management information (V4.2.1)".
- [36] GSM 12.21 (ETSI ETS 300 623): "Digital cellular telecommunications system (Phase 2); Network Management (NM) procedures and messages on the A-bis interface" (V4.5.4).
- [37] GSM 12.22 (ETSI ETS 300 624): "Digital cellular telecommunications system (Phase 2); Interworking of GSM Network Management (NM) procedures and messages at the Base Station Controller (BSC)" (V4.1.4).

3 Abbreviations

For the purposes of the present document, the abbreviations given in GMR-2 01.004 [1] and the following apply:

GSC	Gateway Station Controller
GTS	Gateway Transceiver Subsystem
GW	Gateway
GWS	Gateway Subsystem (consisting of GTS & GSC)
PSMN	Public Satellite Mobile Network

4 Network functions for basic service operation

4.1 Call handling

This set of functions enables the establishment of communications between a mobile subscriber and another network subscriber in one of the following types of network PSTN, ISDN, PSPDN, CSPDN, PLMN and PSMN.

4.1.1 Call from a mobile subscriber registered in VLR

This is the normal case where the call is handled by the mobile subscriber's Home Gateway and is routed according to the dialled number. After the call, the MSC will send the charging information to the HLR, a billing entity and/or store the charging data on tapes or discs as described in GSM 12.05 [28].

4.1.2 Call from a mobile subscriber not registered in VLR

When the VLR receives a request for call set-up parameters from an MSC for an MES originating call, where the MES is not registered in the VLR, the VLR shall initiate a location updating procedure towards the HLR and in response parameters are given concerning category, services and restrictions. The call is then set up as in clause 4.1.1. This case happens when a VLR or an MES failure has occurred or during a longhaul call setup situation. A longhaul call setup situation occurs when a call from a mobile subscriber is assigned to a Gateway, which is not the home gateway of the mobile subscriber. In this situation, a location updating procedure is initiated at the beginning of the call setup and a location cancelling procedure is initiated at the end of the call. These procedures are described in GMR-2 04.008 [21] and GSM 09.02 [23].

4.1.3 Call to a mobile subscriber

The call is routed (re-routed or forwarded) to the Home Gateway and the MES is paged over the standardized radio interface.

Table 1: Overview of network functions

Class of Network Function (NF)	Network Function	Network Support	Interworking with MAP
NF for basic service provision	Call Handling	M	X
	Subscriber Authentication	M	X
	Emergency calls	M	-
	Supplementary Services	M	X
	Short Message Service (SMS)	O	X
	Signalling information element confidentiality	M	X
NF for supporting :	Location registration	M	X
	Handover in the same spotbeam	O	X
	Call re-establishment	O	-
Additional NF for call handling	Queuing	O	-
	OACSU	O	-
	Security related services	M	X
	Discontinuous reception	M	-
	Discontinuous transmission	M/O (note 2)	-
	DTMF	M	-
Network management oriented NF		M (note 1)	X
NOTE 1: The function will not be fully specified by GMR (national specifications will complement).			
NOTE 2: Only the receiver requirements are mandatory, the transmitter requirements support are optional.			

4.1.4 Single-Hop Voice Call from a mobile subscriber to a mobile subscriber

Voice Calls from a mobile subscriber to another mobile subscriber in the same PSMN are routed via the satellite, resulting in a single hop connection between the subscribers and minimizing the end-to-end delay.

4.1.5 Call handling functions in HLR

The HLR should also support control functions for handling of supplementary services as described for each service in the GSM 03.8x and GMR-2 03.08x-series of Specifications, as appropriate.

The HLR should provide information to the gateway MSC to allow it to route calls directed to a mobile subscriber: either a Mobile Station Roaming Number (MSRN) to allow the call to be routed to the visited MSC or a forwarding number if the call is to be forwarded to a destination different from the original one.

The HLR should provide the identity of the visited MSC to the SMS gateway MSC to allow it to route short messages directed to a mobile subscriber; further detail is given in GSM 03.40 [13].

4.1.6 Call handling functions in VLR

The VLR must provide subscriber parameters to the MSC as required for call handling.

The VLR must also support control functions for handling of supplementary services as described for each service in the GSM 03.8x and GMR-2 03.08x-series of Specifications, as appropriate.

4.1.7 Call handling functions in MSC

The MSC must perform normal call routing and call control functions. The MSC will obtain subscriber parameters from its associated VLR.

In some cases, the MSC must be able to act as a gateway MSC to provide an interface to other circuit-switched networks.

4.2 Subscriber identity authentication

The purpose of subscriber identity authentication is defined in GMR-2 02.009 [3].

The authentication mechanism is defined in GMR-2 03.020 [11] and corresponding procedures on the MES-GW interface are defined in GMR-2 04.008 [21].

4.3 Emergency call

4.3.1 General

The land mobile system should be capable of efficient handling of emergency calls from mobile stations. The signalling procedures on the radio path for emergency calls are given in GMR-2 04.008 [21].

4.3.2 Routing

The call should be routed automatically to an appropriate emergency centre based on the geographical location of the mobile station (e.g. based on the identity of the spotbeam on which the call is established).

4.4 Supplementary services

PSMN may offer supplementary services as shown in GMR-2 02.004 [2]. The support of supplementary services will require control procedures in HLRs, VLRs and MSCs in addition to the control procedure in the fixed network. The technical realization of supplementary services is given in the GSM 03.8x and GMR-2 03.08x-series of Specifications, as appropriate.

4.5 Short Message Service

This set of functions allows the transfer of short messages in either direction between a mobile station and a short message service centre. More detailed information is given in GSM 03.40 [13].

4.5.1 Short Message Handling functions in the HLR

The HLR should be able to provide information to allow a short message to be routed from the SMS gateway MSC to the visited MSC and thence to the required mobile station.

4.5.2 Short Message Handling Functions in the VLR

The VLR should provide subscriber parameters to the MSC as required for handling short messages.

4.5.3 Short Message Handling Functions in the MSC

The MSC should perform the functions of relaying short messages in both directions between the fixed network of the PSMN and the GWS.

In some cases the MSC should be able to act as an SMS Gateway MSC to relay short messages from a Short Message Service Centre (SC) to a PSMN, or an SMS Interworking MSC to relay short messages from a PSMN to an SC.

4.6 Signalling information element confidentiality

A procedure should be implemented providing for the confidentiality of signalling information elements on the radio path. In GMR-2 02.009 [3] the signalling information elements which need to be protected are given.

The Encryption Key is calculated in both the MES and the network. Detailed information is given in GMR-2 03.020 [11].

5 Network functions for supporting satellite operation

5.1 Location registration

5.1.1 Definitions

Location registration means that the PSMNs keep track of where mobile stations are located in the system area. The location information is stored in functional units called location registers. Functionally there are two types of location registers:

- the home location register (HLR) where the current location and all subscriber parameters of a mobile station are permanently stored;
- the visitor location register (VLR) where all relevant parameters concerning a mobile station are stored so long as the station is within the area controlled by that visitor location register.

See also GMR-2 03.002 [4] where the network architecture is described.

5.1.2 Procedures

Procedures related to location registration are specified in GMR-2 03.012 [8].

They comprise:

- i) location register updating which enables the MES to inform the network that its location has to be updated, i.e. the MES has received a location area identity which is different from that contained in its memory. In order to avoid unnecessary updating, the current location area identity should be stored in a non-volatile memory in the MES;
- ii) location cancellation which is used to delete an MES from a VLR;
- iii) periodic location updating which enables the location of stationary MESs to be confirmed at a rate determined by the operator.

The procedures also include mechanisms for restoration of location registers after failure. These procedures are defined in GMR-2 03.007 [6].

5.1.3 Information stored in location registers

Information to be stored in location registers is listed in GMR-2 03.008 [7].

5.2 Handover

5.2.1 Definitions

The following is required:

Handover between physical channels of the same Gateway Subsystem (GWS). This capability could be used in the following situations:

- when the physical channel carrying the call is subject to interference or other disturbances;
- when a physical channel or channel equipment carrying a call has to be taken out of service for maintenance or other reasons.

5.2.2 Procedures

The procedures are described in GMR-2 05.008 [22].

5.3 High Penetration Alerting

If the MES does not respond to a "normal" paging signal, the Network shall "alert" the MES of the incoming call by using the 'High Penetration Alerting (HPA)' procedure.

For example, the MES may not respond to a normal paging signal, if the MES is in a 'disadvantaged location' (e.g. interior of a building), where the paging signal cannot be received satisfactorily.

The HPA procedure typically consists of the Network sending an 'alerting' signal at power levels higher than the power level of normal paging signals. The alerting signal produces a distinctive signal to the mobile user, who then will have to move to an 'advantaged location' to receive the call. The details of the HPA procedure are specified in GMR-2 04.008 [21].

5.4 Centralized Call Handling by NCC

The GMR-2 system performs centralized call handling by the Network Control Centre (NCC). For example, NCC generates Paging signals as well as HPA procedures to MESs for Mobile Terminated Calls and processes Random Access signals from MESs for Mobile Originated calls.

6 Additional network functions for call handling

6.1 Queuing

As a PSMN option MES originating and/or MES terminating calls may be queued at the GWS. (NOTE: this queuing is additional to that for normal call handling). However, the following conditions must be met:

- for MES originating calls no queuing indication will be provided to the MES. The queuing will thus be seen as a delayed call set-up for the MES;
- for MES terminating calls the queuing must not conflict with abnormal release conditions in the fixed network. In general, calls that may have passed international circuits should not be queued, i.e. it should not be applied to calls where the originating network is not known to the PSMN.

6.2 Off-Air-Call-Set-Up (OACSU)

6.2.1 General

OACSU may be implemented in PSMNs in order to increase the call handling capacity of the PSMN.

OACSU may be implemented in PSMNs on an optional basis subject to the following conditions:

- i) OACSU should not be used for calls to an international number;
- ii) OACSU should not be used for incoming international calls, except where bilateral agreement has been reached to allow such an application of OACSU. For the avoidance of doubt, OACSU shall not be applied to calls where the call type or originating network is not known by the PSMN;
- iii) foreign MESs not supporting the OACSU procedure should be allowed to access the PSMNs where OACSU is used;
- iv) MESs supporting OACSU should be capable of operating in PSMNs where OACSU is not implemented;
- v) OACSU should only be used for telephone calls.

6.2.2 Signalling procedures

Signalling procedures supporting OACSU are specified in GMR-2 04.008 [21].

6.3 Security related services

PSMNs will offer two security related services on the radio path: confidentiality of user data and confidentiality of signalling information elements and connectionless user data.

6.3.1 Identity confidentiality (Optional)

This feature is not provided in the current version of GMR-2.

6.3.2 User data confidentiality

This service provides for the confidentiality of anything transmitted on a traffic channel. Encryption/decryption is done in the MES and GWS with a key which is calculated in both the MES and network. Detailed information is given in GMR-2 03.020 [11].

6.3.3 Signalling Information Element Confidentiality

This service provides for the confidentiality of anything transmitted on a signalling channel: signalling information to control the service offered to a subscriber or connectionless user data. Encryption/decryption is done in the MES and GWS with a key which is calculated in both the MES and the network. Detailed information is given in GMR-2 03.020 [11].

6.4 Discontinuous reception

Discontinuous reception is a technique used to reduce the battery consumption of mobile stations. The operation of the technique is specified in GMR-2 03.013 [9]. This function must be supported by the network, but is optional for mobile stations.

6.5 Discontinuous Transmission

Discontinuous transmission is a technique used to reduce overall interference level on the air interface, and to reduce the battery consumption in the mobile station. The operation of the technique is specified in GMR-2 05.008 [22]. This function must be supported by the mobile stations, whereas only the receiver requirements are mandatory in the network.

6.6 Support of DTMF

DTMF is supported as defined in GSM 03.14 [10].

7 Network management oriented network functions

Network management functions are dealt with in the 12 series of GMR Specifications. An overview is given in GSM 12.00 [24].

History

Document history		
V1.1.1	March 2001	Publication