



GSM TECHNICAL SPECIFICATION

GSM 02.33

January 1997

Version 5.0.0

Source: ETSI TC-SMG

Reference: TS/SMG-100233Q

ICS: 33.020

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



Digital cellular telecommunications system (Phase 2+); Lawful Interception - stage 1 (GSM 02.33)

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Foreword

This Global System for Mobile communications technical specification (GTS) has been produced by the Special Mobile Group (SMG) Technical Committee (TC) of the European Telecommunications Standards Institute (ETSI).

This specification defines the stage 1 description of a lawful interception feature within the digital cellular telecommunications system (Phase 2/Phase 2+).

GSM technical specifications are produced by TC-SMG to enable the GSM Phase 2+ specifications to become publicly available, prior to submission for the formal ETSI standards approval procedure to become European Telecommunications Standards (ETS). This ensures the earliest possible access to GSM Phase 2+ specifications for all manufacturers, network operators and implementors of the Global System for Mobile communications.

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

Version 5.x.y

where:

- 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.

Reference is made within this GTS to GSM-TSs (note).

NOTE: TC-SMG has produced documents which give the technical specifications for the implementation of the 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 ETs/ETSI Technical Reports (ETRs) (Phase 2). TC-SMG has also produced ETSI GSM TSs which give the technical specifications for the implementation of Phase 2+ enhancements of the digital cellular telecommunications system. These version 5.x.x GSM Technical Specifications may be referred to as GTs.

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1 Scope

This Global System for Mobile communications technical specification (GTS) provides the stage 1 description for a lawful interception function to be implemented in a given GSM PLMN in order for a network operator to be able to fulfil national lawful requirements. It shall be noted that national variation may exist but it is not the intention for this specification to encompass all of them. The purpose of this specification is to cover the options which may be selectable according to national regulations or as required by the GSM PLMN operator in co-operation with their suppliers.

In the preparation of this specification general reference was made to the European Union Council Resolution, January 1995: "International Requirements for the Lawful Interception of Telecommunications".

2 References

This specification 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 specification 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 350): "Digital cellular telecommunications system (Phase 2+); Abbreviations and acronyms".
- [2] The European Union Council Resolution reference: "International Requirements for The Lawful Interception of Telecommunications" (January 1995), (JAI_24_Rev 2, 8197/2/95).
- [3] CCITT Recommendation G.711: "Pulse Code Modulation (PCM) of voice frequencies".

3 Definitions and abbreviations

3.1 Definitions

target: Is the subject of an interception. Different identities might be used (i.e. Mobile Station International ISDN number (MSISDN), optionally International Mobile Subscriber Identity (IMSI) or International Mobile Equipment Identity (IMEI)).

intercept product: Data sent or received by the target, such as speech, fax or data generated by the users of the telecommunication services.

intercept related information: Collection of information associated to telecommunication services involving the target.

law enforcement agency: A body authorized by law to carry out telecommunication interceptions.

3.2 Abbreviations

In addition to those below, abbreviations used in the specification are listed in GSM 01.04.

LEA: Law enforcement agency

4 Description

4.1 General principle

GSM Public Lands Mobile Network (PLMN) shall provide access to the intercept product and the intercept related information of the mobile target on behalf of Law Enforcement Agencies (LEAs).

A mobile target in a given PLMN can be a subscriber of that PLMN, or a subscriber of another PLMN. The intercept product and the related information can only be delivered for activities on that given PLMN.

An unambiguous correlation shall be established between the intercept related information and the intercept product. The intercept related information and the intercept product shall be delivered in as near real time as possible.

4.2 Applicability to telecommunications services

4.2.1 Tele and bearer services (TS/BS)

All tele and bearer services are subject to interception of the target.

Interception is applicable to Short Message Service (SMS) point-to-point, but not SMS Cell Broadcast (SMSCB).

Impact of application to the Voice Group Call Service (VGCS) and the Voice Broadcast Service (VBS) is for further study.

4.2.2 Supplementary services (SS)

4.2.2.1 General

It shall be possible to report any activities regarding supplementary services to the LEA. It may be a national or operator/supplier option to implement this function.

4.2.2.2 Impact

The application of the following supplementary services has no impact on the interception function: Calling Line Identity Presentation/Calling Line Identity Restriction (CLIP/CLIR), Connected Line Identity Presentation/Connected Line Identity Restriction (COLP/COLR), Call Barring services, Advice of Charge services, Closed User Group (CUG), Completion of Calls to Busy Subscriber (CCBS).

4.2.2.3 Intercept of forwarding calls - option

Activation by the target of any Call Forwarding service, Call Deflection, or Explicit Call Transfer (ECT) shall result in the capability to intercept the forwarded, diverted or transferred product.

It may be a national or operator/supplier option which of these are implemented.

4.2.2.4 Intercept of calls placed on HOLD (call waiting and multi party services) - option

In some countries it is a national requirement that when the target puts other parties on HOLD the other parties product will be interrupted. When the other parties rejoin the call, the intercept product shall be reconnected.

4.2.2.5 Network operator specific services

Impact on a network operator's specific services is not covered in this specification.

4.2.3 Other activities

Location information in the format of cell global identity (CGI) should be available with call related activities. Conversion to other formats of location information (e.g. latitude/longitude) is not covered by this specification. It is a matter of national or operator/supplier option whether location information shall be provided in connection with non call related activities, e.g. location update.

5 Normal Operation

5.1 Intercept administration

A secure means of administrating the service by the PLMN operator and/or intercept requesting entity is necessary. This mechanism shall provide means to activate, deactivate, show, or list targets in the GSM PLMN as quick as technically possible. The function shall be policed by appropriate authentication and audit procedures.

5.1.1 Activation

As a result of the activation it shall be possible to request for the specified target either the intercept product, the intercept related information or both, and the LEA destination addresses for the delivery of the intercept product and intercept related information if required. These shall be selectable on a PLMN basis according to national options.

5.1.2 Deactivation

As a result of deactivation it shall be possible to stop all interception activities for the specified target.

5.1.3 Security

The intercept function shall only be accessible by authorized personnel.

An audit log of use of the intercept function (successful or failed) shall be maintained, accessible only to authorized users;

No indication shall be given to any PLMN staff except authorized personnel that the intercept function has been activated on a target.

5.2 Intercept invocation

5.2.1 General

5.2.1.1 Invocation events for lawful interception

Lawful interception is invoked when:

- a voice call is requested - either originated from or terminated to the target;
- a circuit switched data call is requested - either originated from or terminated to the target;
- location information related to the subscriber is modified by the subscriber attaching or detaching from the network, or if there is a change in location, (see subclause 4.2.3);
- an SMS transfer is requested - either originated from or terminated to the target.

5.2.1.2 Invocation of interception regarding normal GSM service

The invocation of lawful interception shall not alter the operation of a target's services or provide indication to any party involved in communication with the target. Lawful interception shall not alter the standard function of GSM network elements. If lawful interception is activated during a call, the call shall not be intercepted. If lawful interception is deactivated all ongoing intercept activities shall continue till they are completed.

5.2.1.3 Correlation of information and product

When lawful interception is invoked, intercept related information and/or intercept product shall be sent to the LEA. Where both intercept related information and intercept product are sent to the LEA, then these two types of information shall be able to be correlated by the LEA, and they should be sent to the LEA in as near real time as possible.

5.2.2 Intercept related information

This subclause describes the service requirements for the provision of intercept related information when the target is using the following basic services:

5.2.2.1 Intercept related information events

Intercept related information concerning call progress may be provided to the LEA when the target is using the following basic services:

- telephony - teleservice 11;
- alternate speech and facsimile - teleservice 61;
- automatic facsimile group 3 - teleservice 62;
- data services - bearer services 2x, 3x;
- alternate speech and data - bearer service 61;
- speech followed by data - bearer service 81.

The following intercept related information events concerning call progress may, if applicable to the Tele Service/Bearer Service (TS/BS) and available, be provided to the LEA:

- the call establishment attempt;
- the answer of the call;
- the disconnecting of the call;
- changes of location of the target.

For the case of an SMS transaction the intercept related information is provided in conjunction with the SMS intercepted product to the LEA (see subclause 5.2.3.3)

5.2.2.2 Intercept related information provided to the LEA

The specific information provided by the intercept related information events will vary depending upon: the specific event, and the availability of information in a particular scenario (for example when interworking with network of different capabilities - i.e. non-ISDN networks).

A list of the type of information that may be provided to the LEA by intercept related information events, includes:

- an activation reference identity;
- the target identity which has been intercepted (e.g. MSISDN, IMSI, IMEI if applicable);
- called number;
- calling number;
- numbers related to forwarding and multi party calls;
- type of service used;
- location information of target (Cell Global Identity);
- time of event;
- call release reason.

5.2.2.3 Delivery of intercept related information

Intercept related information shall be delivered to the LEA using the specific address information that has been provided as part of the activation of the service.

5.2.3 Intercept product

5.2.3.1 Speech and single channel circuit switched data/fax

This subclause describes the service requirements for the provision of intercept product when the target is using the following basic services:

- telephony - teleservice 11;
- alternate speech and facsimile - teleservice 61;
- automatic facsimile group 3 - teleservice 62;
- data services - bearer services 2x, 3x;
- alternate speech and data - bearer service 61;
- speech followed by data - bearer service 81.

Intercept product should be in "clear" form - no GSM radio interface or PLMN generated radio interface encoding or encryption should be present, (the PLMN can not remove subscriber encryption). Intercept product shall be maintained during handovers.

5.2.3.2 Delivery of intercept product

Intercept product shall be delivered to the LEA using the specific address information provided as part of the lawful intercept activation.

Any additional delay in setting up the call caused by the invocation of lawful interception should not be noticeable to the target or other users on the call.

5.2.3.3 SMS

Intercept product for SMS is sent to the LEA along with the intercept related information for both SMS mobile originated and SMS mobile terminated.

5.2.4 Correlation between intercept product and intercept related information

Intercept product and intercept related information shall be presented to the LEA in a way that allows for accurate correlation between these two components.

5.2.5 Security related to intercept invocation

There shall be arrangements between the GSM PLMN and the LEA to ensure uncorrupted and confidential delivery of information and product related to lawful interception.

6 Exceptional procedures

When a failure occurs while establishing the connection towards the LEA to transfer the intercept product this shall not result in any interruption of the ongoing telecommunications service. No further specific requirements apply for the intercept product in the GSM PLMN.

When failure occurs while trying to provide the interception related information it shall be temporarily stored in the GSM PLMN and some further attempts shall be made to deliver it if available.

7 Interworking considerations

While it is recognized that speech encoding in CCITT G.711 format presently does not raise any problem, the transmission of GSM encoded speech in the future - speech transmission for mobile to mobile calls without transcoding - will create difficulties to provide the product in the correct format to the LEA. It shall be noted that forcing transcoding for the intercepted calls will result in a noticeable and perceived systematic degradation in the speech quality for the mobile parties.

8 Charging aspects

8.1 Charging principles

The PLMN may require to raise charges for lawful interception. Charging may be based on one or more of the following:

- use of network resources;
- activation and deactivation of the target; or
- every intercept invocation.

The PLMN shall be capable of producing intercept charging data. It shall be possible to produce this data in such a way that access by non authorized personnel or the target is precluded.

8.2 Charging characteristics

Some of parameters listed below might not be applicable in specific GSM PLMNs:-

8.2.1 Activation of the target

- Activation reference;
- Mobile target identity;
- Date of activation;
- Time of activation;
- Destination address;
- Specified output(s);
- Network identity.

8.2.2 Deactivation of the target

- Activation reference;
- Mobile target identity;
- Date of deactivation;
- Time of deactivation;
- Network identity.

8.2.3 Intercept invocation

- Activation reference;
- Mobile target identity;
- Date of activity;
- Start time of activity;
- Stop time or duration of the activity;
- Service type, Speech, data, SMS.

9 Minimum Service Requirements

Quality of service, capacity and reliability are the subject of bilateral agreement between the Regulation (Licensing) authorities and the GSM PLMN operator.

History

Document history	
January 1997	Publication of GSM 02.33 version 5.0.0