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Digital cellular telecommunications system (Phase 2+) (GSM); Group Call Control (GCC) protocol (GSM 04.68 version 5.3.1 Release 1996)

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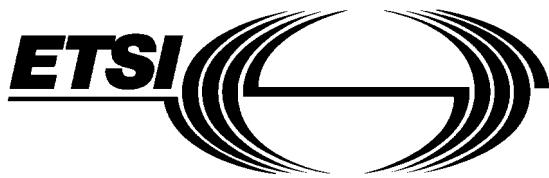
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(GSM 04.68 version 5.3.1 Release 1996)**

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

Internet: secretariat@etsi.fr - <http://www.etsi.org>

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

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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 specifies the Group Call Control (GCC) protocol used by the Voice Group Call Service (VGCS) on the radio interface within the digital cellular telecommunications system (Phase 2+).

The contents of this ETS is subject to continuing work within TC-SMG and may change following formal TC-SMG approval. Should TC-SMG modify the contents of this ETS, it will be resubmitted for OAP by ETSI with an identifying change of release date and an increase in version number as follows:

Version 5.x.y

- 5 Indicates GSM Phase 2+ Release 1996;
- x the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.;
- y the third digit is incremented when editorial only changes have been incorporated in the specification.

Transposition dates

Date of adoption of this ETS:	10 December 1999
Date of latest announcement of this ETS (doa):	31 March 2000
Date of latest publication of new National Standard or endorsement of this ETS (dop/e):	30 September 2000
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1 Scope

This European Telecommunications Standard (ETS) specifies the Group Call Control (GCC) protocol used by the Voice Group Call Service (VGCS) on the radio interface.

2 Normative references

This ETS incorporates by dated and undated references, 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 350): "Digital cellular telecommunication system (Phase 2+); Abbreviations and acronyms".
- [2] GSM 02.68 (ETS 300 925): "Digital cellular telecommunication system (Phase 2+); "Voice Group Call Service (VGCS) - Stage 1".
- [3] GSM 03.03 (ETS 300 927): "Digital cellular telecommunication system (Phase 2+); Numbering, addressing and identification".
- [4] GSM 03.67 (ETS 300 932): "Digital cellular telecommunication system (Phase 2+); enhanced Multi-Level Precedence and Pre-emption service (eMLPP) - Stage 2".
- [5] GSM 03.68 (ETS 300 933): "Digital cellular telecommunication system (Phase 2+); Voice Group Call Service (VGCS) - Stage 2".
- [6] GSM 04.06 (ETS 300 938): "Digital cellular telecommunication system; Mobile Station - Base Station System (MS - BSS) interface Data Link (DL) layer specification".
- [7] GSM 04.07 (ETS 300 939): "Digital cellular telecommunication system (Phase 2+); Mobile radio interface signalling layer 3 General aspects".
- [8] GSM 04.08 (ETS 300 940): "Digital cellular telecommunication system (Phase 2+); Mobile radio interface layer 3 specification".

3 Definitions and abbreviations

3.1 Definitions

Definitions used in this ETS are also defined in GSM 02.68.

For the purposes of this ETS, the following terms and definitions apply:

attachment of the user connection: See GSM 04.08, subclause 5.2.

calling user: GCC entity in the Mobile Station (MS) initiating or having initiated a group call.

clearing the context related to the group call establishment: All running GCC timers in the relevant GCC entity are stopped, all attributes in the relevant GCC entity are deleted.

downlink: Network to mobile station direction.

group call: Is used in the same sense as "voice group call".

group call channel: Combined uplink/downlink to be allocated in each cell of the group call area for a particular group call. The uplink can be used by the presently talking service subscriber only. All MSs of the listening service subscribers in one cell shall listen to the common downlink.

group receive mode: See GSM 04.08.

originating mobile station: Mobile station initiating or having initiated the group call. (Note that, in certain situations, a MS assumes to be the originating MS of a group call without actually being the originating MS of that group call. Note that there may be one or none originating MS for a given group call.)

uplink: Mobile station to network direction.

3.2 Abbreviations

Abbreviations used in this ETS are also listed in GSM 01.04.

For the purposes of this ETS, the following abbreviations apply:

GCC Group Call Control

4 Applicability

Support of the group call protocol is optional in the MS and in the network.

5 Main concepts

This ETS describes the group call control (GCC) protocol, which is one of the protocols of the Connection Management (CM) sublayer (see GSM 04.07).

There is in general more than one MS engaged in a group call. Consequently, there is in general more than one MS with a GCC entity engaged in the same group call, and there is one GCC entity in the network engaged in that group call.

Under which conditions a GCC message is passed from lower (sub-)layers to the GCC entity is defined in the specifications of the sub-layers.

The MS shall ignore GCC messages that it receives which were sent in unacknowledged mode and which explicitly specify as destination a mobile identity which is not a mobile identity of the MS.

Higher layers and the MM sub-layer decide when to accept parallel GCC transactions and when/whether to accept GCC transactions in parallel to other CM transactions.

The group call may be initiated by a mobile user or by a dispatcher. Specification of a protocol for dispatchers is out of the scope of this ETS. Hence, in the scope of this ETS, there are:

- one GCC entity in the network; and
- one or more than one GCC entities in different MSs

engaged in a group call, and one or none of the MSs is the originator of the group call (called the originating MS in this ETS). Note that, in certain situations, a MS assumes to be the originator of a group call without being the originator.

The originator of the GCC transaction chooses the Transaction Identifier (TI). A MS not assuming to be the originator of the transaction will choose the transaction identifier received from the network, setting the TI flag to $1+x \text{ mod } 2$ where x is the received TI flag.

This ETS describes the group call control protocol only with regard to two peer entities, one in a MS, the other one in the network. The call control entities are described as communicating finite state machines which exchange messages across the radio interface and communicate internally with other protocol (sub)layers. In particular, the GCC protocol uses the MM and RR sublayer specified in GSM 04.08. This description is only normative as far as the consequential externally observable behaviour is concerned. For simplicity, instead of using the terms "GCC entity in the MS" and "GCC entity in the network", this ETS often uses the terms "MS" and "network" if no confusion may arise.

Certain sequences of actions of the two peer entities compose "elementary procedures" which are used as a basis for the description in this ETS. These elementary procedures are defined in clause 6.

The network should apply supervisory functions to verify that the GCC procedures are progressing and if not, take appropriate means to resolve the problems. This, however, is out of the scope of this ETS.

6 Elementary procedures for Group Call Control

6.1 Overview

6.1.1 General

The elementary procedures may be grouped into the following classes:

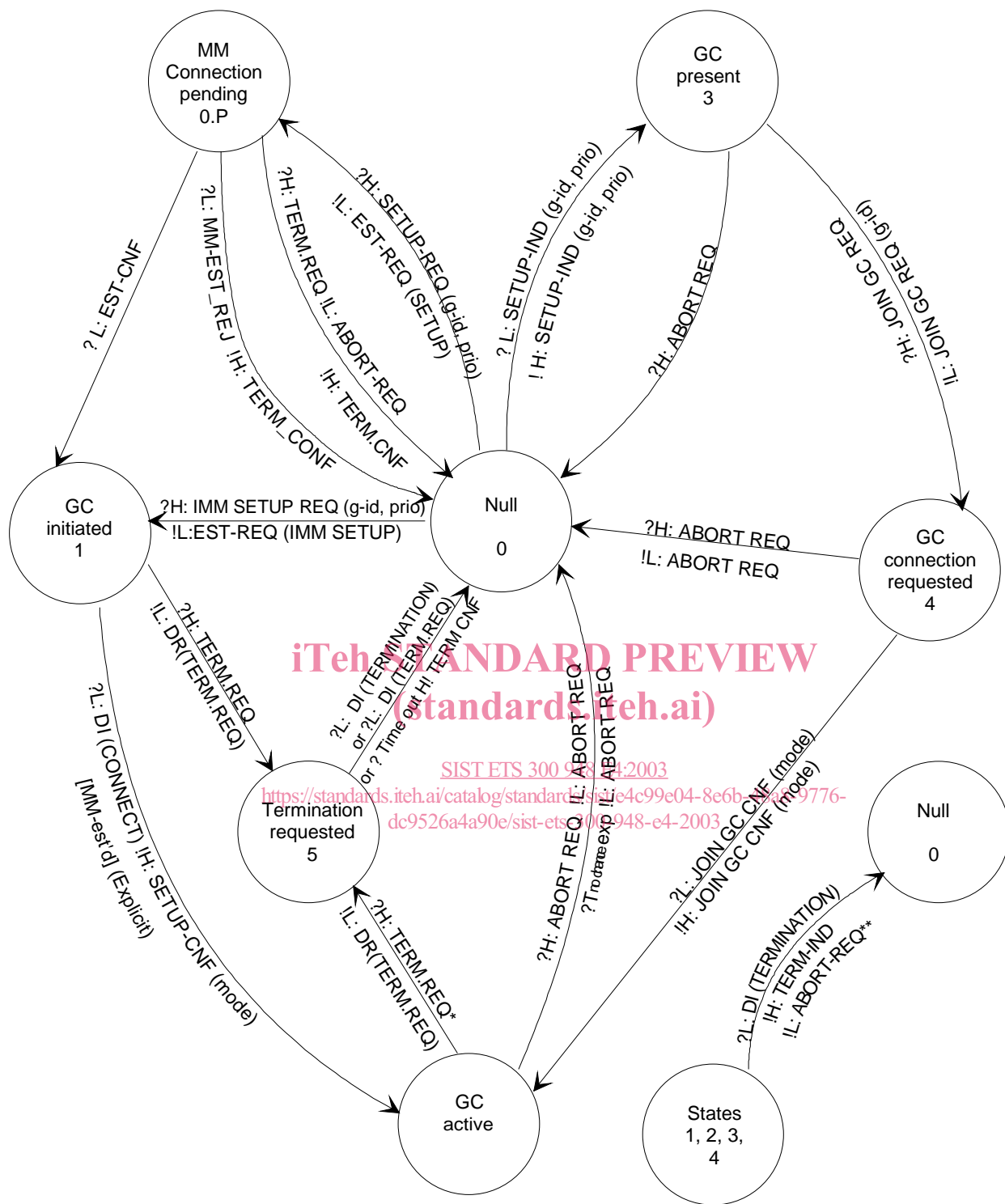
- group call establishment procedures;
- group call termination procedures;
- call information phase procedures;
- miscellaneous procedures.

Figure 6.1 gives an overview of the main states and transitions on the MS side.

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* if MS assumes to be the originator of the group call.

** if not in RR connected mode.

Figure 6.1: Overview group call control protocol/MS side