



**SLOVENSKI STANDARD**  
**SIST EN 300 967 V8.0.1:2003**

01-december-2003

---

8 [[ ]HJb]`WV] b]`hY`Y\_ca i b]\_UW`g\_]`g]ghYa `fZuU&ZL`E;`cj cf`g`dc`cj] bc` \ ]f`c`g`h`c`E`  
?cX`5BG=7`nU`\_cXY`\_g]ghYa U; GA`nU[ cj cf`g`dc`cj] bc` \ ]f`c`g`h`c`f] GA`\$`\*\$`ž  
fU`h` ]WU,`\$`%`ž]nXU`U`%`--`Ł

Digital cellular telecommunications system (Phase 2+) (GSM); Half rate speech; ANSI-C code for the GSM half rate speech codec (GSM 06.06 version 8.0.1 Release 1999)

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

[SIST EN 300 967 V8.0.1:2003](https://standards.iteh.ai/catalog/standards/sist/8d0646ec-d369-4e1d-b730-75a5cd60c5b/sist-en-300-967-v8-0-1-2003)

Ta slovenski standard je istoveten z: [EN 300 967 Version 8.0.1](https://standards.iteh.ai/catalog/standards/sist/8d0646ec-d369-4e1d-b730-75a5cd60c5b/sist-en-300-967-v8-0-1-2003)

---

**ICS:**

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

**SIST EN 300 967 V8.0.1:2003** en

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

[SIST EN 300 967 V8.0.1:2003](https://standards.iteh.ai/catalog/standards/sist/8d0646ec-d369-4e1d-b730-73a3cd060c3b/sist-en-300-967-v8-0-1-2003)

<https://standards.iteh.ai/catalog/standards/sist/8d0646ec-d369-4e1d-b730-73a3cd060c3b/sist-en-300-967-v8-0-1-2003>

# ETSI EN 300 967 V8.0.1 (2000-11)

European Standard (Telecommunications series)

**Digital cellular telecommunications system (Phase 2+);  
Half rate speech;  
ANSI-C code for the GSM half rate speech codec  
(GSM 06.06 version 8.0.1 Release 1999)**

iTeh STANDARD PREVIEW  
(standards.iteh.ai)

**GSM**®  
GLOBAL SYSTEM FOR  
MOBILE COMMUNICATIONS

[SIST EN 300 967 V8.0.1:2003](https://standards.iteh.ai/catalog/standards/sist/8d0646ec-d369-4e1d-b730-73a3cd060c3b/sist-en-300-967-v8-0-1-2003)

<https://standards.iteh.ai/catalog/standards/sist/8d0646ec-d369-4e1d-b730-73a3cd060c3b/sist-en-300-967-v8-0-1-2003>



---

**Reference**

REN/SMG-110606Q8

---

**Keywords**

CODEC, Digital cellular telecommunications system, Global System for Mobile communications (GSM), speech, ANSI-C code

**ETSI**650 Route des Lucioles  
F-06921 Sophia Antipolis Cedex - FRANCE

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

Siret N° 348 623 562 00017 - NAF 742 C  
Association à but non lucratif enregistrée à la  
Sous-Préfecture de Grasse (06) N° 7803/88**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**SIST EN 300 967 V8.0.1:2003<https://standards.iteh.ai/catalog/standards/sist/8d0646ec-d369-4e1d-b730-73a3cd060c3b/sist-en-300-967-v8-0-1-2003>

---

**Important notice**

Individual copies of the present document can be downloaded from:

<http://www.etsi.org>

The present document may be made available in more than one electronic version or in print. In any case of existing or perceived difference in contents between such versions, the reference version is the Portable Document Format (PDF). In case of dispute, the reference shall be the printing on ETSI printers of the PDF version kept on a specific network drive within ETSI Secretariat.

Users of the present document should be aware that the document may be subject to revision or change of status. Information on the current status of this and other ETSI documents is available at <http://www.etsi.org/tb/status/>

If you find errors in the present document, send your comment to:  
editor@etsi.fr

---

**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 2000.  
All rights reserved.

---

## Contents

Intellectual Property Rights .....	4
Foreword .....	4
1 Scope.....	6
2 References .....	6
3 Definitions and abbreviations.....	6
3.1 Definitions .....	6
3.2 Abbreviations.....	7
4 C code structure.....	7
4.1 Directory structure.....	7
4.2 Program execution.....	8
4.3 Code hierarchy .....	8
5 ANSI-C code for the GSM half rate speech codec .....	13
<b>Annex A (informative): Change Request History .....</b>	<b>14</b>
History .....	15

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

[SIST EN 300 967 V8.0.1:2003](https://standards.iteh.ai/catalog/standards/sist/8d0646ec-d369-4e1d-b730-73a3cd060c3b/sist-en-300-967-v8-0-1-2003)

<https://standards.iteh.ai/catalog/standards/sist/8d0646ec-d369-4e1d-b730-73a3cd060c3b/sist-en-300-967-v8-0-1-2003>

---

## Intellectual Property Rights

IPRs essential or potentially essential to the present document may have been declared to ETSI. The information pertaining to these essential IPRs, if any, is publicly available for **ETSI members and non-members**, and can be found in ETSI SR 000 314: "*Intellectual Property Rights (IPRs); Essential, or potentially Essential, IPRs notified to ETSI in respect of ETSI standards*", which is available from the ETSI Secretariat. Latest updates are available on the ETSI Web server (<http://www.etsi.org/ipr>).

Pursuant to the ETSI IPR Policy, no investigation, including IPR searches, has been carried out by ETSI. No guarantee can be given as to the existence of other IPRs not referenced in ETSI SR 000 314 (or the updates on the ETSI Web server) which are, or may be, or may become, essential to the present document.

---

## Foreword

This European Standard (Telecommunications series) has been produced by ETSI Technical Committee Special Mobile Group (SMG).

An electronic attachment accompanies the present document, this contains clause 5, the bit-exact ANSI-C code for the GSM half rate codec.

The present document specifies the half rate speech traffic channels for the digital cellular telecommunications system. The present document is part of a series covering the half rate speech traffic channels as described below:

- |                  |  |
|------------------|--|
| GSM 06.02        | "Digital cellular telecommunications system (Phase 2+); Half rate speech; Half rate speech processing functions".  |
| <b>GSM 06.06</b> | <b>"Digital cellular telecommunications system (Phase 2+); Half rate speech; ANSI-C code for the GSM half rate speech codec".</b>                        |
| GSM 06.07        | "Digital cellular telecommunications system (Phase 2+); Half rate speech; Test sequences for the GSM half rate speech codec".                            |
| GSM 06.20        | "Digital cellular telecommunications system (Phase 2+); Half rate speech; Half rate speech transcoding".   |
| GSM 06.21        | "Digital cellular telecommunications system (Phase 2+); Half rate speech; Substitution and muting of lost frames for half rate speech traffic channels". |
| GSM 06.22        | "Digital cellular telecommunications system (Phase 2+); Half rate speech; Comfort noise aspects for half rate speech traffic channels".                  |
| GSM 06.41        | "Digital cellular telecommunications system (Phase 2+); Half rate speech; Discontinuous Transmission (DTX) for half rate speech traffic channels".       |
| GSM 06.42        | "Digital cellular telecommunications system (Phase 2+); Half rate speech; Voice Activity Detector (VAD) for half rate speech traffic channels".          |

The contents of the present document is subject to continuing work within SMG and may change following formal SMG approval. Should SMG modify the contents of the present document it will be re-released with an identifying change of release date and an increase in version number as follows:

Version 8.x.y

where:

- 8 indicates Release 1999 of GSM Phase 2+.
- 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.

<b>National transposition dates</b>	
Date of adoption of this EN:	3 November 2000
Date of latest announcement of this EN (doa):	28 February 2001
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	31 August 2001
Date of withdrawal of any conflicting National Standard (dow):	31 August 2001

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

[SIST EN 300 967 V8.0.1:2003](https://standards.iteh.ai/catalog/standards/sist/8d0646ec-d369-4e1d-b730-73a3cd060c3b/sist-en-300-967-v8-0-1-2003)

<https://standards.iteh.ai/catalog/standards/sist/8d0646ec-d369-4e1d-b730-73a3cd060c3b/sist-en-300-967-v8-0-1-2003>

---

# 1 Scope

The present document contains an electronic copy of the ANSI-C code for the GSM half rate codec. The ANSI-C code is necessary for a bit exact implementation of the half rate speech transcoder (GSM 06.20 [2]), Voice Activity Detector (GSM 06.42 [6]), comfort noise (GSM 06.22 [4]), Discontinuous Transmission (GSM 06.41 [5]) and example solutions for substituting and muting of lost frames (GSM 06.21 [3]).

---

# 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, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies.
- A non-specific reference to an ETS shall also be taken to refer to later versions published as an EN with the same number.
- For this Release 1999 document, references to GSM documents are for Release 1999 versions (version 8.x.y).

- [1] GSM 01.04: "Digital cellular telecommunication system (Phase 2+); Abbreviations and acronyms".
- [2] GSM 06.20: "Digital cellular telecommunications system (Phase 2+); Half rate speech; Half rate speech transcoding". [SIST EN 300 967 V8.0.1:2003](https://standards.iteh.ai/catalog/standards/sist/8d0646ec-d369-4e1d-b730-73a3cd060c3b/sist-en-300-967-v8-0-1-2003)
- [3] GSM 06.21: "Digital cellular telecommunications system (Phase 2+); Half rate speech; Substitution and muting of lost frame for half rate speech traffic channels".
- [4] GSM 06.22: "Digital cellular telecommunications system (Phase 2+); Half rate speech; Comfort noise aspects for half rate speech traffic channels".
- [5] GSM 06.41: "Digital cellular telecommunications system (Phase 2+); Half rate speech; Discontinuous Transmission (DTX) for half rate speech traffic channels".
- [6] GSM 06.42: "Digital cellular telecommunications system (Phase 2+); Half rate speech; Voice Activity Detector (VAD) for half rate speech traffic channels".
- [7] GSM 06.07: "Digital cellular telecommunications system (Phase 2+); Half rate speech; Test sequences for the GSM half rate speech codec".
- [8] American National Standards Institute ANSI 9899 (1990): "Programming Language - C (ISO)".

---

# 3 Definitions and abbreviations

## 3.1 Definitions

Definition of terms used in the present document can be found in GSM 06.20 [2], GSM 06.21 [3], GSM 06.22 [4], GSM 06.41 [5] and GSM 06.42 [6].



## 3.2 Abbreviations

For the purposes of the present document, the following abbreviations apply:

ANSI	American National Standards Institute
DS-HD	Double Sided High Density
ETS	European Telecommunication Standard
GSM	Global System for Mobile communications
I/O	Input/Output
ROM	Read Only Memory

For abbreviations not given in this clause, see GSM 01.04 [1].

---

## 4 C code structure

This clause gives an overview of the structure of the bit-exact C code and provides an overview of the contents and organization of the electronic attachment accompanying the present document.

The C code has been verified on the following systems:

- Sun Microsystem's <sup>1)</sup> workstations and Sun Microsystems acc;
- IBM <sup>2)</sup> PC/AT compatible computers and Borlands Turbo-C <sup>3)</sup> compiler;
- VAX <sup>4)</sup> and Digital Equipment Corporations CC.

ANSI-C 9899 [8] was selected as the programming language because portability was desirable.

The code representation is contained in a MS-DOS <sup>5)</sup> file (called Disk and contained in archive en\_300967v080001p0.ZIP which accompanies the present document.

[SIST EN 300 967 V8.0.1:2003](https://standards.iteh.ai/catalog/standards/sist/8d0646ec-d369-4e1d-b730-1c1060c3b/sist-en-300-967-v8-0-1-2003)

<https://standards.iteh.ai/catalog/standards/sist/8d0646ec-d369-4e1d-b730-1c1060c3b/sist-en-300-967-v8-0-1-2003>

### 4.1 Directory structure

A listing of the directories is given in table 1.

**Table 1: Directory structure listing**

Directory name	Contents	Size (bytes)
\c	C files and headers	1 215 563
\d	example binary data input and output files	72 400
\exec	executables and makefiles	5 509
\utils	utility programs and the "reid" program	49 531
readme.txt	usage description of files	9 116

The C code file (called Disk and contained in archive en\_300967v080001p0.ZIP) which accompanies the present document has one main directory and four subdirectories. The top directory has in it the file readme.txt which explains the installation procedure, along with some miscellaneous descriptive information regarding the code.

Below this directory, are the four subdirectories. The "c" subdirectory contains all the source code and header files. This directory alone is essential, the others aid in the building, or testing of the code. All ROM data is in this source directory. After installation, this directory can be made read only.

- 
- 1) Registered trade mark of Sun Microsystems
  - 2) Registered trade mark of International Business Machines
  - 3) Registered trade mark of Borland
  - 4) Registered trade mark of Digital Equipment Corporation
  - 5) Registered trade mark of Microsoft