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Foreword

This European Standard (Telecommunications series) has been produced by the 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".

GSM 06.06 "Digital cellular telecommunications system (Phase 2+); Half rate speech; ANSI-C code for the GSM half rate speech codec".

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".

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Version 7.x.y

where:

7 indicates Release 1998 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.

National transposition dates	
Date of adoption of this EN:	31 December 1999
Date of latest announcement of this EN (doa):	31 March 2000
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	30 September 2000
Date of withdrawal of any conflicting National Standard (dow):	30 September 2000

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 1998 document, references to GSM documents are for Release 1998 versions (version 7.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".

[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 subclause, 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 [1)] workstations and Sun Microsystems acc;
- IBM [2)] PC/AT compatible computers and Borlands Turbo-C [3)] compiler;
- VAX [4)] 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 [5)] file (called Disk and contained in archive 8vo03i0o.ZIP which accompanies the present document.

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 8vo03i0o.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
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5) Registered trade mark of Microsoft