



SLOVENSKI STANDARD
SIST EN 300 723 V8.1.1:2003
01-december-2003

8 [[]HJb]`WV] b]`hY`ca i b]_UW`g_]`g]ghYa `fZuU&ZL`E`nVc`yUbYdc`bc\]HfcgfbY
 Z b_WY`nUcVXYUj c` [c] cfU`E`Gd`cyb]`cd]g`f] GA`\$*`)`%ZfUh`]WU,`"%Z]nXUU%--Ł

Digital cellular telecommunications system (Phase 2+) (GSM); Enhanced Full Rate (EFR) speech processing functions; General description (GSM 06.51 version 8.1.1 Release 1999)

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST EN 300 723 V8.1.1:2003](https://standards.iteh.ai/catalog/standards/sist/a9ef1219-8028-4f55-b35c-b0d1e29d0c40/sist-en-300-723-v8-1-1-2003)

Ta slovenski standard je istoveten z: [EN 300 723 Version 8.1.1](https://standards.iteh.ai/catalog/standards/sist/a9ef1219-8028-4f55-b35c-b0d1e29d0c40/sist-en-300-723-v8-1-1-2003)

ICS:

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

SIST EN 300 723 V8.1.1:2003 en

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST EN 300 723 V8.1.1:2003](https://standards.iteh.ai/catalog/standards/sist/a9ef1219-8028-4f55-b35c-b6df29dbc40/sist-en-300-723-v8-1-1-2003)

<https://standards.iteh.ai/catalog/standards/sist/a9ef1219-8028-4f55-b35c-b6df29dbc40/sist-en-300-723-v8-1-1-2003>

ETSI EN 300 723 V8.1.1 (2000-11)

European Standard (Telecommunications series)

**Digital cellular telecommunications system (Phase 2+);
Enhanced Full Rate (EFR) speech processing functions;
General description
(GSM 06.51 version 8.1.1 Release 1999)**

iTeh STANDARD PREVIEW
(standards.iteh.ai)

GSM®

GLOBAL SYSTEM FOR
MOBILE COMMUNICATIONS

[SIST EN 300 723 V8.1.1:2003](https://standards.iteh.ai/catalog/standards/sist/a9ef1219-8028-4f55-b35c-b6dfe29dbc40/sist-en-300-723-v8-1-1-2003)

<https://standards.iteh.ai/catalog/standards/sist/a9ef1219-8028-4f55-b35c-b6dfe29dbc40/sist-en-300-723-v8-1-1-2003>



Reference

REN/SMG-110651Q8R1

KeywordsDigital cellular telecommunications system,
Global System for Mobile communications (GSM)**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 300 723 V8.1.1:2003<https://standards.iteh.ai/catalog/standards/sist/a9ef1219-8028-4f55-b35c-b6df29dbc40/sist-en-300-723-v8-1-1-2003>

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 | 5 |
| 2 References | 5 |
| 3 Definitions and abbreviations..... | 6 |
| 3.1 Definitions | 6 |
| 3.2 Abbreviations | 6 |
| 4 General | 6 |
| 5 Enhanced Full Rate speech channel transcoding..... | 8 |
| 6 Enhanced Full Rate speech channel discontinuous transmission (DTX) | 8 |
| 7 Enhanced Full Rate speech channel Voice Activity Detection (VAD)..... | 9 |
| 8 Enhanced Full Rate speech channel comfort noise insertion | 9 |
| 9 Enhanced Full Rate speech channel lost speech frame substitution and muting..... | 9 |
| 10 Enhanced Full Rate codec homing | 10 |
| 11 Alternative Enhanced Full Rate implementation using the Adaptive Multi Rate 12.2 kbit/s mode..... | 10 |
| Annex A (informative): Change Request History..... | 11 |
| History | 12 |

[SIST EN 300 723 V8.1.1:2003](https://standards.iteh.ai/catalog/standards/sist/a9ef1219-8028-4f55-b35c-b6dfe29dbc40/sist-en-300-723-v8-1-1-2003)

<https://standards.iteh.ai/catalog/standards/sist/a9ef1219-8028-4f55-b35c-b6dfe29dbc40/sist-en-300-723-v8-1-1-2003>

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).

The present document introduces the Enhanced Full Rate (EFR) speech traffic channels within the digital cellular telecommunications system.

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.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

| National transposition dates | |
|--|------------------|
| Date of adoption of this EN: | 24 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 |

1 Scope

The present document is an introduction to GSM 06.60 [6], GSM 06.61 [7], GSM 06.62 [8], GSM 06.81 [9] and GSM 06.82 [10] ENs dealing with the speech processing functions in the Enhanced Full Rate channel of the GSM system. A general overview of the speech processing functions is given, with reference to the ENs where each function is specified in detail.

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).

- STANDARD PREVIEW**
(standards.iteh.ai)
<https://standards.iteh.ai/catalog/standards/sist/a9ef1219-8028-4f55-b35c-b0dfe29dbc40/sist-en-300-723-v8-1-1-2003>
- [1] GSM 01.04: "Digital cellular telecommunications system (Phase 2+); Abbreviations and acronyms".
- [2] GSM 03.50: "Digital cellular telecommunications system (Phase 2+); Transmission planning aspects of the speech service in the GSM Public Land Mobile Network (PLMN) system".
- [3] GSM 05.03: "Digital cellular telecommunications system (Phase 2+); Channel coding".
- [4] GSM 06.53: "Digital cellular telecommunications system (Phase 2+); ANSI-C code for the GSM Enhanced Full Rate (EFR) speech codec".
- [5] GSM 06.54: "Digital cellular telecommunications system (Phase 2+); Test vectors for the GSM Enhanced Full Rate (EFR) speech codec".
- [6] GSM 06.60: "Digital cellular telecommunications system (Phase 2+); Enhanced Full Rate (EFR) speech transcoding".
- [7] GSM 06.61: "Digital cellular telecommunications system (Phase 2+); Substitution and muting of lost frame for Enhanced Full Rate (EFR) speech traffic channels".
- [8] GSM 06.62: "Digital cellular telecommunications system (Phase 2+); Comfort noise aspects for Enhanced Full Rate (EFR) speech traffic channels".
- [9] GSM 06.81: "Digital cellular telecommunications system (Phase 2+); Discontinuous transmission (DTX) for Enhanced Full Rate (EFR) speech traffic channels".
- [10] GSM 06.82: "Digital cellular telecommunications system (Phase 2+); Voice Activity Detector (VAD) for Enhanced Full Rate (EFR) speech traffic channels".

3 Definitions and abbreviations

3.1 Definitions

Definition of terms used in the present document can be found in GSM 06.60 [6], GSM 06.61 [7], GSM 06.62 [8], GSM 06.81 [9] and GSM 06.82 [10].

3.2 Abbreviations

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

| | |
|---------|--|
| ACELP | Algebraic Code Excited Linear Prediction |
| BFI | Bad Frame Indication |
| BSS | Base Station System |
| CCITT | Comité Consultatif International Télégraphique et Téléphonique |
| DTX | Discontinuous Transmission |
| ETS | European Telecommunication Standard |
| GSM | Global System for Mobile communications |
| MS | Mobile Station |
| PCM | Pulse Code Modulated |
| PLMN | Public Land Mobile Network |
| PSTN | Public Switched Telephone Network |
| RF | Radio Frequency |
| RSS | Radio SubSystem |
| RX | Receive |
| SACCH | Slow Associated Control CHannel |
| SID | SIllence Descriptor |
| SP flag | SPeech flag |
| TAF | Time Alignment Flag |
| TX | Transmit |

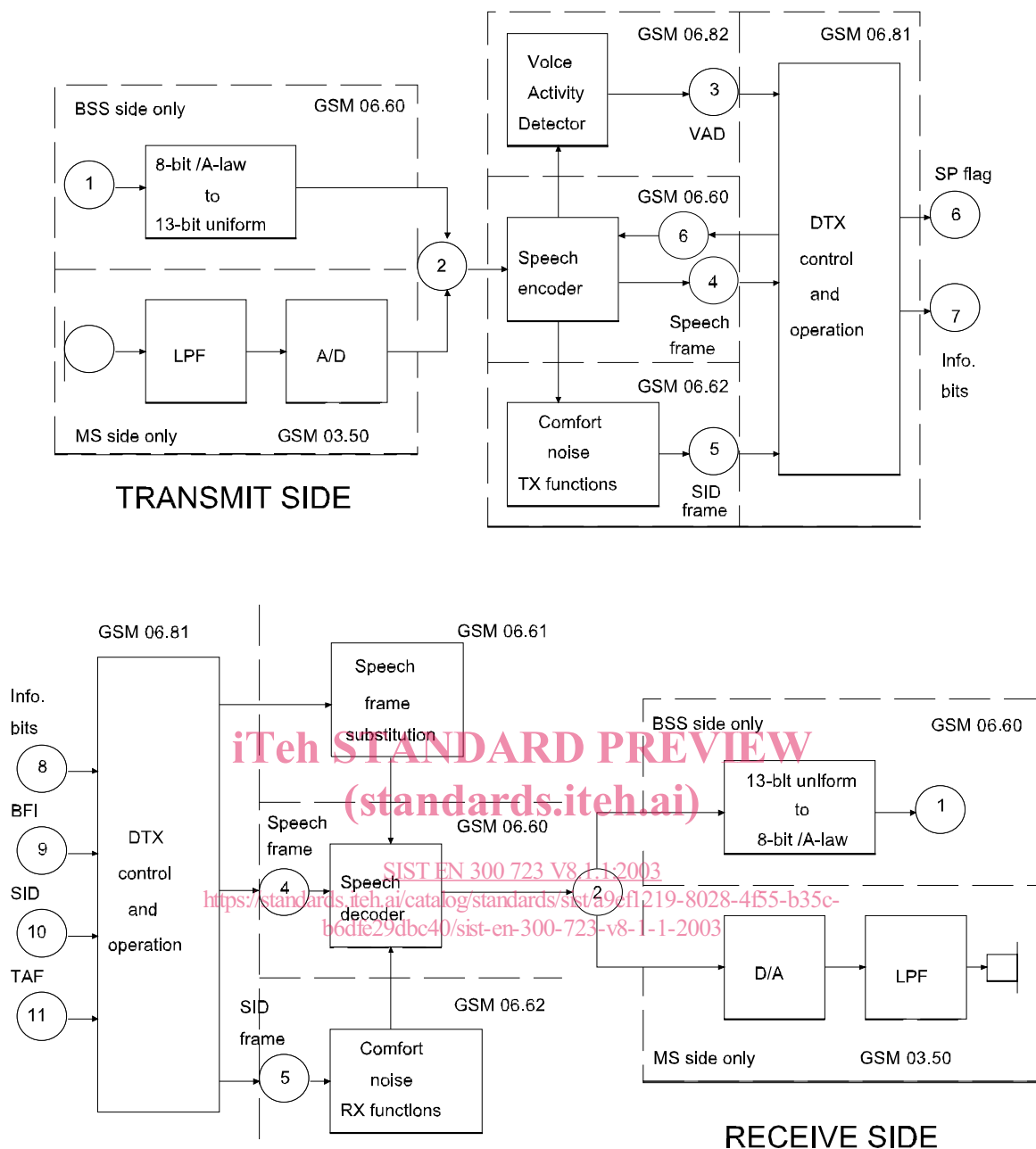
For abbreviations not given in this clause, see GSM 01.04 [1].

4 General

Figure 1 presents a reference configuration where the various speech processing functions are identified. In this figure, the relevant Standards for each function are also indicated.

In figure 1, the audio parts including analogue to digital and digital to analogue conversion are included, to show the complete speech path between the audio input/output in the Mobile Station (MS) and the digital interface of the PSTN. The detailed specification of the audio parts are contained in GSM 03.50 [2]. These aspects are only considered to the extent that the performance of the audio parts affect the performance of the speech transcoder.

An alternative and fully interoperable implementation using as a basis the 12.2 kbit/s mode of the Adaptive Multi Rate speech coder is described in clause 11.



- 1) 8-bit /A-law or μ -law (PCS 1900) PCM (CCITT recommendation G.711), 8 000 samples/s.
- 2) 13-bit uniform PCM, 8 000 samples/s.
- 3) Voice Activity Detector (VAD) flag.
- 4) Encoded speech frame, 50 frames/s, 244 bits/frame.
- 5) Silence Descriptor (SID) frame, 244 bits/frame.
- 6) SPeech (SP) flag, indicates whether information bits are speech or SID information.
- 7) Information bits delivered to the radio subsystem.
- 8) Information bits received from the radio subsystem.
- 9) Bad Frame Indication.
- 10) Silence Descriptor (SID) flag.
- 11) Time Alignment Flag (TAF), marks the position of the SID frame within the Slow Associated Control Channel (SACCH) multiframe.

Figure 1: Overview of audio processing functions