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Digital cellular telecommunications system (Phase 2+) (GSM); Half rate speech; Discontinuous Transmission (DTX) for half rate speech traffic channels (GSM 06.41 version 8.0.1 Release 1999)

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GLOBAL SYSTEM FOR
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Foreword

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

The present document is a GSM technical specification version 7 and is part of the 1998 release of the GSM Technical Specifications. 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".

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.

National transposition dates	
Date of adoption of this EN:	3 November 2000
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Date of withdrawal of any conflicting National Standard (dow):	31 August 2001

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1   Scope

The present document gives a description of the general baseband operation of half rate speech traffic channels in the transmitter and in the receiver of GSM Mobile Stations (MS)s and Base Station Systems (BSS)s during Discontinuous Transmission (DTX).

For clarity, the description is structured according to the block diagrams in figures 1 and 4. Except in the case described below, this structure of distributing the various functions between system entities is not mandatory for implementation, as long as the operation on the air interface and on the speech decoder output remains the same.

In the case of BSSs where the speech transcoder is located remotely in the Base Station Controller (BSC), the implementation of the interfaces between the DTX Handlers and the Radio Sub System (RSS) as described in the present document together with all their flags is mandatory, being a part of the A-bis interface as described in GSM 08.61 [10].

The DTX functions described in the present document are mandatory for implementation in all GSM MSs. The receiver requirements are mandatory for implementation in all GSM BSSs, the transmitter requirements only for those where downlink DTX will be used.

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 04.08: "Digital cellular telecommunication system (Phase 2+); Mobile radio interface layer 3 specification".

[3]   GSM 05.05: "Digital cellular telecommunications system (Phase 2+); Radio transmission and reception".

[4]   GSM 05.08: "Digital cellular telecommunication system (Phase 2+); Radio subsystem link control".

[5]   GSM 06.02: "Digital cellular telecommunications system (Phase 2+); Half rate speech Part 1: Half rate speech processing functions".

[6]   GSM 06.20: "Digital cellular telecommunications system (Phase 2+); Half rate speech; Half rate speech transcoding".

[7]   GSM 06.21: "Digital cellular telecommunications system (Phase 2+); Half rate speech; Substitution and muting of lost frames for half rate speech traffic channels".

[8]   GSM 06.22: "Digital cellular telecommunications system (Phase 2+); Half rate speech; Comfort noise aspects for half rate speech traffic channels".

[9]　　　　　GSM 06.42: "Digital cellular telecommunications system (Phase 2+); Half rate speech; Voice Activity Detector (VAD) for half rate speech traffic channels".

[10]　　　　GSM 08.61: "Digital cellular telecommunications system (Phase 2+); Inband control of remote transcoders and rate adaptors for half rate traffic channels".

[11]　　　　GSM 06.06: "Digital cellular telecommunications system (Phase 2+); Half rate speech Part 7: ANSI-C code for the GSM half rate speech codec".

3　　Definitions, symbols and abbreviations

3.1　　Definitions

For the purposes of the present document, the following terms and definitions apply:

accepted SID frame: traffic frame which is flagged with SID= "1" or SID= "2" by the Radio Subsystem.

bad traffic frame: traffic frame flagged BFI= "1" (Bad Frame Indication) or with UFI= "1" (Unreliable Frame Indication) by the Radio Subsystem.

frame: time interval of 20 ms corresponding to the time segmentation of the half rate speech transcoder defined in GSM 06.20 (ETS 300 969) [6]), also used as a short term for a traffic frame.

good speech frame: good traffic frame which is not an accepted SID frame.

good traffic frame: traffic frame flagged BFI= "0" and UFI= "0" by the Radio Subsystem.

GS averaging period: period in which the quantized energy tweak parameters GS are averaged: it corresponds to the hangover period.

hangover period: period of 7 frames added at the end of a speech burst in which VAD flag = "0" and SP flag= "1".

invalid SID frame: accepted SID frame which was not classified as valid SID frame. This frame is not valid for updating comfort noise parameters, but the frame conveys information that comfort noise generations should be started or continued.

lost SID frame: unusable frame received when the RX DTX Handler is generating comfort noise and a SID frame is expected (Time Alignment Flag TAF= "1").

lost speech frame: unusable frame received when the RX DTX Handler is passing on traffic frames directly to the speech decoder.

SID code word: fixed bit pattern defined in GSM 06.22 [8], for labelling a traffic frame as a SID frame.

SID field: bit positions defined in GSM 06.22 [8], of the SID codeword within a SID frame.

SID frame: frame characterised by the SID (Silence Descriptor) code word. It conveys information on the acoustic background noise.

SP flag: boolean flag, generated by the TX DTX handler, indicating the presence of a speech frame ("1") or the presence of a SID frame ("0").

speech frame: traffic frame that cannot be classified as a SID frame.

traffic frame: block of 112 information bits transmitted on the half rate speech traffic channel.

unusable frame: bad traffic frame that is not an accepted SID frame.

VAD flag: boolean flag, generated by the VAD algorithm defined in GSM 06.42 [9], indicating the presence ("1") or the absence ("0") of a speech frame.

valid SID frame: good traffic frame flagged with SID= "2" by the Radio Subsystem. This frame is valid for updating comfort noise parameters at any time.