

SLOVENSKI STANDARD

SIST ETS 300 725 E1:2003

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Digitalni celil'ni telekomunikacijski sistem (faza 2+) ņ Preskuŕalna zaporedja za kodek izboljŕanega govora s polno hitrostjo (EFR) sistema GSM (GSM 06.54, razli'ica 5.1.1)

Digital cellular telecommunications system (Phase 2+) (GSM); Test sequences for the GSM Enhanced Full Rate (EFR) speech codec (GSM 06.54 version 5.1.1)

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ICS:

33.070.50	Globalni sistem za mobilno telekomunikacijo (GSM)	Global System for Mobile Communication (GSM)
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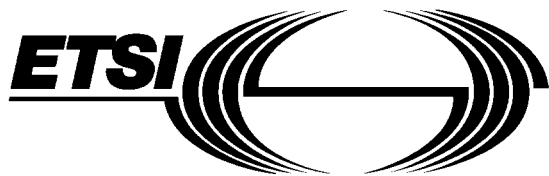
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Digital cellular telecommunications system (Phase 2+); Test sequences for the GSM Enhanced Full Rate (EFR) speech codec (GSM 06.54 version 5.1.1)

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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).

Eight 3.5 inch diskettes are attached to the back cover of this ETS, the diskettes contain test sequences for a bit exact implementation of the Enhanced Full Rate (EFR) speech transcoder.

The diskettes contain LHA compressed files and are labelled as follows:

Diskette 1/8	ETS 300 725 clause 10: Test sequences for the GSM Enhanced Full Rate (EFR) speech codec; Speech test sequences TEST0.xxx to TEST8.xxx.
Diskette 2/8	ETS 300 725 clause 10: Test sequences for the GSM Enhanced Full Rate (EFR) speech codec; Speech test sequences TEST09.xxx to TEST16.xxx.
Diskette 3/8	ETS 300 725 clause 10: Test sequences for the GSM Enhanced Full Rate (EFR) speech codec; Speech test sequences TEST17.xxx to TEST20.xxx, Codec homing and synchronisation sequences.
Diskette 4/8	ETS 300 725 clause 10: Test sequences for the GSM Enhanced Full Rate (EFR) speech codec; DTX test sequences.
Diskettes 5-8/8	ETS 3000 725 clause 10: Test sequences for the GSM Enhance Full Rate (EFR) speech codec; 8 bit A- and μ -law compressed test sequences for alternative TRAU testing.

This ETS specifies the digital test sequences for the GSM enhanced full rate speech codec for the digital cellular telecommunications system.

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1 Scope

This European Telecommunication Standard (ETS) specifies the digital test sequences for the GSM enhanced full rate speech codec. These sequences test for a bit exact implementation of the enhanced full rate speech transcoder (GSM 06.60 (ETS 300 726) [2]), Voice Activity Detection (GSM 06.82 (ETS 300 730) [6]), comfort noise (GSM 06.62 (ETS 300 728) [4]) and the discontinuous transmission (GSM 06.81 (ETS 300 729) [5]).

2 Normative references

This ETS incorporates by dated and undated reference, 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 06.60 (ETS 300 726): "Digital cellular telecommunications system; Enhanced Full Rate (EFR) speech transcoding".
- [3] GSM 06.61 (ETS 300 727): "Digital cellular telecommunications system; Substitution and muting of lost frames for Enhanced Full Rate (EFR) speech traffic channels".
- [4] GSM 06.62 (ETS 300 728): "Digital cellular telecommunications system; Comfort noise aspects for Enhanced Full Rate (EFR) speech traffic channels".
- [5] GSM 06.81 (ETS 300 729): "Digital cellular telecommunications system; Discontinuous Transmission (DTX) for Enhanced Full Rate (EFR) speech traffic channels".
- [6] GSM 06.82 (ETS 300 730): "Digital cellular telecommunications system; Voice Activity Detection (VAD) for Enhanced Full Rate (EFR) speech traffic channels".
- [7] GSM 06.53 (ETS 300 724): "Digital cellular telecommunications system; ANSI-C code for the GSM Enhanced Full Rate (EFR) speech codec".
- [8] GSM 06.51 (ETS 300 723): "Digital cellular telecommunications system; Enhanced Full Rate (EFR) speech coding functions; General description".

3 Definitions and abbreviations

3.1 Definitions

Definition of terms used in this ETS can be found in GSM 06.60 (ETS 300 726) [2], GSM 06.61 (ETS 300 727) [3], GSM 06.62 (ETS 300 728) [4], GSM 06.81 (ETS 300 729) [5] and GSM 06.82 (ETS 300 730) [6].

3.2 Abbreviations

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

ETS	European Telecommunication Standard
GSM	Global System for Mobile communications

For abbreviations not given in this subclause see GSM 01.04 (ETR 100) [1].

4 General

Digital test Voice Activity Detection (GSM 06.82 (ETS 300 730) [6]), comfort noise (GSM 06.62 (ETS 300 728) [4]) and the discontinuous transmission (GSM 06.81 (ETS 300 729) [5]).

The test sequences may also be used to verify installations of the ANSI C code in GSM 06.53 (ETS 300 725) [7].

Clause 5 describes the format of the files which contain the digital test sequences. Clause 6 describes the test sequences for the speech transcoder. Clause 7 describes the test sequences for the VAD, comfort noise and discontinuous transmission.

Clause 8 describes the method by which synchronisation is obtained between the test sequences and the speech codec under test.

Clause 9 describes the alternative acceptance testing of the speech encoder and decoder in the TRAU by means of 8 bit A- or μ -law compressed test sequences on the A-Interface.

Electronic copies of the digital test sequences are provided as clause 109, these digital test sequences are contained in the 3.5 inch diskettes attached to the back cover of this ETS 300 725.

5 Test sequence format

This clause provides information on the format of the digital test sequences for the GSM enhanced full rate speech transcoder (GSM 06.60 (ETS 300 726) [2]), Voice Activity Detection (GSM 06.82 (ETS 300 730) [6]), comfort noise (GSM 06.62 (ETS 300 728) [4]) and the discontinuous transmission (GSM 06.81 (ETS 300 729) [5]).

5.1 File format

The test sequence files are provided on floppy disks (3.5 inch) which are formatted according to the high capacity (1.44 Mb) specifications for MS-DOS¹⁾ IBM²⁾ PC/AT compatible computers.

Following decompression, four types of file are provided:

- Files for input to the GSM enhanced full rate speech encoder: *.INP
- Files for comparison with the encoder output: *.COD
- Files for input to the GSM enhanced full rate speech decoder: *.DEC
- Files for comparison with the decoder output: *.OUT

The *.DEC files are generated from the corresponding *.COD files.

Tables 1, 2, 3 and 4 define the formats of the four types of file.

Each speech parameter within the speech frame of 244 bits/20 ms is contained in a serial string of 16 bit words, where each word contains the value of one bit of the parameter. In each string of n 16 bit words containing the n bits of a parameter, the most significant bit of the parameter is written first, and the least significant bit is written last. The bit value contained in a single 16 bit word is either 0x0000 or 0x0001 (right justified) for the binary values of "0" and "1", respectively. See Table 6 of GSM 06.60 (ETS 300 726) [2] for the order of occurrence and bit allocation of speech parameters within the speech frame of 244 bits/20 ms.

The samples in the encoder input signal and in the decoder output signal are left justified.

¹⁾ This is a trademark of Microsoft.

²⁾ This is a trademark of International Business Machines

5.2 Codec homing

Each *.INP file includes two homing frames at the start of the test sequence. The function of these frames is to reset the speech encoder state variables to their initial value. In the case of a correct installation of the ANSI-C simulation (GSM 06.53 (ETS 300 725) [7]), all speech encoder output frames shall be identical to the corresponding frame in the *.COD file. In the case of a correct hardware implementation undergoing testing, the first speech encoder output frame is undefined and need not be identical to the first frame in the *.COD file, but all remaining speech encoder output frames shall be identical to the corresponding frames in the *.COD file.

Each *.DEC file includes two homing frames at the start of the test sequence. The function of these frames is to reset the speech decoder state variables to their initial value. In the case of a correct installation of the ANSI-C simulation (GSM 06.53 (ETS 300 725) [7]), all speech decoder output frames shall be identical to the corresponding frame in the *.OUT file. In the case of a correct hardware implementation undergoing testing, the first speech decoder output frame is undefined and need not be identical to first frame in the *.OUT file, but all remaining speech decoder output frames shall be identical to the corresponding frames in the *.OUT file.

Table 1: Encoder input sequence (*.INP) format

Name	Description	No. of bits	Justification
s(n)	Encoder input signal	13	Left

Table 2: Encoder output sequence (*.COD) format

Name	Description	No. of bits	Justification
Speech parameters			
SPEECH	Serial stream of speech parameter bits to the channel encoder	244	Right
Additional information			
VAD	Voice activity detection flag	1	Right
SP	SP flag	1	Right

Table 3: Decoder input sequence (*.DEC) format

Name	Description	No. of bits	Justification
Additional information			
BFI	Bad Frame Indicator flag	1	Right
Speech parameters			
SPEECH	Serial stream of speech parameter bits to the channel encoder	244	Right
Additional information			
SID	Silence Descriptor flag	1	Right
TAF	Time Alignment Flag	1	Right

Table 4: Decoder output sequence (*.OUT) format

Name	Description	No. of bits	Justification
s'(n)	Decoder output signal	13	Left

6 Speech codec test sequences

This clause describes the test sequences designed to exercise the GSM enhanced full rate speech transcoder (GSM 06.60 (ETS 300 726) [2]).