

ITU-T

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

G.722.2

Annex C
(12/2017)

SERIES G: TRANSMISSION SYSTEMS AND MEDIA,
DIGITAL SYSTEMS AND NETWORKS

Digital terminal equipments – Coding of voice and audio
signals

Wideband coding of speech at around 16 kbit/s
using Adaptive Multi-Rate Wideband (AMR-WB)

Annex C: Fixed-point C-code

Recommendation ITU-T G.722.2 – Annex C

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For further details, please refer to the list of ITU-T Recommendations.

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Recommendation ITU-T G.722.2

Wideband coding of speech at around 16 kbit/s using Adaptive Multi-Rate Wideband (AMR-WB)

Annex C

Fixed-point C-code

Summary

Annex C to Recommendation ITU-T G.722.2 specifies the bit-exact ANSI C-code implementation of the AMR-WB algorithm specified in Recommendation ITU-T G.722.2, its Annexes A and B, and its Appendix I (non-normative).

This annex includes an electronic attachment containing the C-code of the G.722.2 AMR-WB speech transcoder. The C-code has been updated to harmonize with the AMR-WB coder in 3GPP specification TS 26.173 V14.0.0 (2017-04).

History

Edition	Recommendation	Approval	Study Group	Unique ID*
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1.4	ITU-T G.722.2 Annex D	2002-01-13	16	11.1002/1000/5663
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2.6	ITU-T G.722.2 Annex E (2002) Cor. 1	2003-07-29	16	11.1002/1000/6875
2.7	ITU-T G.722.2 Annex F	2002-11-29	16	11.1002/1000/6180
2.8	ITU-T G.722.2 App. I	2002-01-13	16	11.1002/1000/6096
2.9	ITU-T G.722.2 App. I (2002) Amd. 1	2003-07-29	16	11.1002/1000/6877
2.9	ITU-T G.722.2 (2003) Cor. 1	2005-09-13	16	11.1002/1000/8575
2.10	ITU-T G.722.2 (2003) Cor. 2	2007-01-13	16	11.1002/1000/9019
2.11	ITU-T G.722.2 Annex C	2008-11-13	16	11.1002/1000/9635
2.12	ITU-T G.722.2 Annex C	2017-12-14	16	11.1002/1000/13429
2.13	ITU-T G.722.2 Annex D	2017-12-14	16	11.1002/1000/13430

* To access the Recommendation, type the URL <http://handle.itu.int/> in the address field of your web browser, followed by the Recommendation's unique ID. For example, <http://handle.itu.int/11.1002/1000/11830-en>.

FOREWORD

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The World Telecommunication Standardization Assembly (WTSA), which meets every four years, establishes the topics for study by the ITU-T study groups which, in turn, produce Recommendations on these topics.

The approval of ITU-T Recommendations is covered by the procedure laid down in WTSA Resolution 1.

In some areas of information technology which fall within ITU-T's purview, the necessary standards are prepared on a collaborative basis with ISO and IEC.

NOTE

In this Recommendation, the expression "Administration" is used for conciseness to indicate both a telecommunication administration and a recognized operating agency.

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As of the date of approval of this Recommendation, ITU had received notice of intellectual property, protected by patents, which may be required to implement this Recommendation. However, implementers are cautioned that this may not represent the latest information and are therefore strongly urged to consult the TSB patent database at <http://www.itu.int/ITU-T/ipr/>.

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Recommendation ITU-T G.722.2

Wideband coding of speech at around 16 kbit/s using Adaptive Multi-Rate Wideband (AMR-WB)

Annex C

Fixed-point C-code

(This annex forms an integral part of this Recommendation.)

C.1 C-code structure

This annex¹ gives an overview of the structure of the bit-exact C-code for the correct implementation of the ITU-T G.722.2 main body, its Annex A (comfort noise aspects), Annex B (source controlled rate operation) and Appendix I (error concealment of erroneous or lost frames). It provides an overview of the contents and organization of the C-code attached to this annex. In case of discrepancy between the description given in the several parts of ITU-T G.722.2 (including its Annexes A, B and Appendix I) and the ANSI C-source code, the algorithm description of the ANSI C-code shall prevail.

The C-code has been verified on a number of systems

- Sun Microsystems workstations and GNU gcc compiler
- HP workstations and cc compiler
- IBM PC compatible computers with Windows NT4 operating system and GNU gcc compiler.

ANSI-C was selected as the programming language because portability was desirable.

C.1.1 Contents of the C source code

The C-code distribution has all files in the root level.

The distributed files with suffix "c" contain the source code and the files with suffix "h" are the header files. The ROM data is contained mostly in files with suffix "tab".

The C code distribution also contains one speech coder installation verification data file, "spch_dos.inp". The reference encoder output file is named "spch_dos.cod", the reference decoder input file is named "spch_dos.dec" and the reference decoder output file is named "spch_dos.out". These four files are formatted such that they are correct for an IBM PC/AT compatible computer. The same files with reversed byte order of the 16 bit words are named "spch_unx.inp", "spch_unx.cod", "spch_unx.dec" and "spch_unx.out", respectively.

Final verification of bit-exactness is to be performed using the adaptive multi-rate wideband test sequences described in Annex D of ITU-T G.722.2.

Makefiles are provided for the platforms in which the C-code has been verified (see above). Once the software is installed, this directory will have a compiled version of *encoder* and *decoder* (the bit-exact C executables of the speech codec) and all the object files.

¹ This annex contains an electronic attachment with the AMR-WB codec fixed-point C-code