



**International
Standard**

ISO/IEC 13818-1

**Information technology — Generic
coding of moving pictures and
associated audio information —**

**Part 1:
Systems**

*Technologies de l'information — Codage générique des images
animées et du son associé —*

Partie 1: Systèmes

**Tenth edition
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This document was prepared by ITU-T (as ITU-T H.222.0) and drafted in accordance with its editorial rules, in collaboration with Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 29, *Coding of audio, picture, multimedia and hypermedia information*.

This tenth edition cancels and replaces the ninth edition (ISO/IEC 13818-1:2023), which has been technically revised.

The main changes are as follows:

- the usage of certain codec parameters and the definition of certain program element descriptors is clarified;
- in Annex T.4 the interpretation of the optional 'codecs' parameter for the audio layer is clarified;
- a field name is adjusted in the syntax and semantics of the MPEG-H 3D audio descriptor;
- in 2.6.110 the syntax of the MPEG-H 3D audio scene descriptor is corrected and field names are aligned with the names in the specification to which they refer;
- in 2.6.115 some clarification is added for the MPEG-H 3D audio multi-stream descriptor with respect to the semantics of the fields *thisStreamID* and *auxiliaryStreamID*.

A list of all parts in the ISO/IEC 13818 series can be found on the ISO and IEC websites.

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INTERNATIONAL STANDARD ISO/IEC 13818-1 RECOMMENDATION ITU-T H.222.0 v10

Information technology – Generic coding of moving pictures and associated audio information: Systems

Summary

This Recommendation | International Standard specifies the system layer of the coding. It was developed in 1994 to principally support the combination and synchronization of video and audio coding methods defined in ISO/IEC 13818 Part 2 (ITU-T H.262) and Part 3. Since 1994, this standard has been extended to support additional video coding specifications (e.g., ISO/IEC 14496-2, ITU-T H.264 | ISO/IEC 14496-10, ITU-T H.265 | ISO/IEC 23008-2 and ITU-T T.800 | ISO/IEC 15444-1 Annex M JPEG 2000 video), audio coding specifications (e.g., ISO/IEC 13818-7 and ISO/IEC 14496-3), system streams (e.g., ISO/IEC 14496-1 and ISO/IEC 15938-1), ISO/IEC 23009-1 dynamic adaptive streaming over HTTP (DASH), ISO/IEC 13818-11 intellectual property management and protection (IPMP) as well as generic metadata. The system layer supports six basic functions:

- 1) the synchronization of multiple compressed streams on decoding;
- 2) the interleaving of multiple compressed streams into a single stream;
- 3) the initialization of buffering for decoding start up;
- 4) continuous buffer management;
- 5) time identification; and
- 6) multiplexing and signalling of various components in a system stream.

Recommendation ITU-T H.222.0 | ISO/IEC 13818-1 multiplexed bit stream is either a transport stream or a program stream. Both streams are constructed from packetized elementary stream (PES) packets and packets containing other necessary information. Both stream types support multiplexing of video and audio compressed streams from one program with a common time base. The transport stream additionally supports the multiplexing of video and audio compressed streams from multiple programs with independent time bases. For almost error-free environments the program stream is generally more appropriate, supporting software processing of program information. The transport stream is more suitable for use in environments where errors are likely.

Either multiplexed bit stream is constructed in two layers: the outermost layer is the system layer, and the innermost is the compression layer. The system layer provides the functions necessary for using one or more compressed data streams in a system. The video and audio parts of this Specification define the compression coding layer for audio and video data. Coding of other types of data is not defined by this Recommendation | International Standard, but is supported by the system layer provided that the other types of data adhere to the constraints defined in this Recommendation | International Standard.

This tenth edition was initially developed as Amd. 1 to the ninth edition and was eventually approved as a new edition.

The main changes are as follows:

- The usage of certain codec parameters and the definition of certain program element descriptors is clarified;
- in clause T.4 the interpretation of the optional 'codecs' parameter for the audio layer is clarified;
- a field name is adjusted in the syntax and semantics of the MPEG-H 3D audio descriptor;
- in 2.6.110 the syntax of the MPEG-H 3D audio scene descriptor is corrected and field names are aligned with the names in the specification to which they refer;
- in 2.6.115 some clarification is added for the MPEG-H 3D audio multi-stream descriptor with respect to the semantics of the fields `thisStreamID` and `auxiliaryStreamID`;

History *

Edition	Recommendation	Approval	Study Group	Unique ID
1.0	ITU-T H.222.0	1995-07-10	15	11.1002/1000/1071
1.1	ITU-T H.222.0 (1995) Amd. 1	1996-11-11	16	11.1002/1000/3834
1.2	ITU-T H.222.0 (1995) Amd. 2	1996-11-11	16	11.1002/1000/4096
1.3	ITU-T H.222.0 (1995) Technical Cor. 1	1998-02-06	16	11.1002/1000/4532
1.4	ITU-T H.222.0 (1995) Amd. 3	1998-02-06	16	11.1002/1000/4228
1.5	ITU-T H.222.0 (1995) Amd. 4	1998-02-06	16	11.1002/1000/4229
1.6	ITU-T H.222.0 (1995) Amd. 5	1999-05-27	16	11.1002/1000/4498
1.7	ITU-T H.222.0 (1995) Amd. 6	1999-05-27	16	11.1002/1000/4671
1.8	ITU-T H.222.0 (1995) Amd. 7	2000-02-17	16	11.1002/1000/4926
2.0	ITU-T H.222.0	2000-02-17	16	11.1002/1000/5142
2.1	ITU-T H.222.0 (2000) Technical Cor. 1	2001-03-01	16	11.1002/1000/5419
2.2	ITU-T H.222.0 (2000) Technical Cor. 2	2002-03-29	16	11.1002/1000/5675
2.3	ITU-T H.222.0 (2000) Amd. 1	2002-12-14	16	11.1002/1000/6190
2.4	ITU-T H.222.0 (2000) Amd. 1 Cor. 1	2003-06-29	16	11.1002/1000/6449
2.5	ITU-T H.222.0 (2000) Amd. 2	2003-06-29	16	11.1002/1000/6363
2.6	ITU-T H.222.0 (2000) Amd. 3	2004-03-15	16	11.1002/1000/7208
2.7	ITU-T H.222.0 (2000) Technical Cor. 3	2005-01-08	16	11.1002/1000/7435
2.8	ITU-T H.222.0 (2000) Amd. 4	2005-01-08	16	11.1002/1000/7436
2.9	ITU-T H.222.0 (2000) Amd. 5	2005-01-08	16	11.1002/1000/7437
2.10	ITU-T H.222.0 (2000) Technical Cor. 4	2005-09-13	16	11.1002/1000/8560
3.0	ITU-T H.222.0	2006-05-29	16	11.1002/1000/8802
3.1	ITU-T H.222.0 (2006) Amd. 1	2007-01-13	16	11.1002/1000/9024
3.2	ITU-T H.222.0 (2006) Amd. 2	2007-08-29	16	11.1002/1000/9214
3.3	ITU-T H.222.0 (2006) Cor. 1	2008-06-13	16	11.1002/1000/9471
3.4	ITU-T H.222.0 (2006) Cor. 2	2009-03-16	16	11.1002/1000/9692
3.5	ITU-T H.222.0 (2006) Amd. 3	2009-03-16	16	11.1002/1000/9691
3.6	ITU-T H.222.0 (2006) Cor. 3	2009-12-14	16	11.1002/1000/10621
3.7	ITU-T H.222.0 (2006) Cor. 4	2009-12-14	16	11.1002/1000/10622
3.8	ITU-T H.222.0 (2006) Amd. 4	2009-12-14	16	11.1002/1000/10623
3.9	ITU-T H.222.0 (2006) Amd. 5	2011-05-14	16	11.1002/1000/11287
3.10	ITU-T H.222.0 (2006) Amd. 6	2011-05-14	16	11.1002/1000/11288
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4.1	ITU-T H.222.0 (2012) Amd. 1	2014-01-13	16	11.1002/1000/12054
4.2	ITU-T H.222.0 (2012) Amd. 2	2014-01-13	16	11.1002/1000/12055
4.3	ITU-T H.222.0 (2012) Amd. 3	2014-01-13	16	11.1002/1000/12056
4.4	ITU-T H.222.0 (2012) Amd. 4	2014-01-13	16	11.1002/1000/12057
4.5	ITU-T H.222.0 (2012) Amd. 5	2014-10-14	16	11.1002/1000/12306
5.0	ITU-T H.222.0	2014-10-14	16	11.1002/1000/12359
5.1	ITU-T H.222.0 (2014) Amd. 1	2015-04-29	16	11.1002/1000/12452
5.2	ITU-T H.222.0 (2014) Amd. 1 Cor. 1	2015-11-29	16	11.1002/1000/12625
5.3	ITU-T H.222.0 (2014) Amd. 2	2015-12-14	16	11.1002/1000/12632
5.4	ITU-T H.222.0 (2014) Amd. 3	2015-12-14	16	11.1002/1000/12633
5.5	ITU-T H.222.0 (2014) Amd. 1 Cor. 2	2016-07-14	16	11.1002/1000/12899
5.5	ITU-T H.222.0 (2014) Cor. 1	2016-07-14	16	11.1002/1000/12903
5.7	ITU-T H.222.0 (2014) Amd. 4	2016-07-14	16	11.1002/1000/12900
5.8	ITU-T H.222.0 (2014) Amd. 5	2016-07-14	16	11.1002/1000/12901
5.9	ITU-T H.222.0 (2014) Amd. 6	2016-07-14	16	11.1002/1000/12902

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5.10	ITU-T H.222.0 (2014) Amd. 3 Cor. 1	2017-03-01	16	11.1002/1000/13184
5.10	ITU-T H.222.0 (2014) Cor. 2	2017-03-01	16	11.1002/1000/13188
5.12	ITU-T H.222.0 (2014) Amd. 7	2017-03-01	16	11.1002/1000/13186
5.13	ITU-T H.222.0 (2014) Amd. 8	2017-03-01	16	11.1002/1000/13187
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6.1	ITU-T H.222.0 (2017) Amd. 1	2017-12-14	16	11.1002/1000/13431
7.0	ITU-T H.222.0	2018-08-29	16	11.1002/1000/13664
7.1	ITU-T H.222.0 (2018) Cor. 1	2019-11-29	16	11.1002/1000/14106
7.2	ITU-T H.222.0 (2018) Amd. 1	2019-11-29	16	11.1002/1000/14105
8.0	ITU-T H.222.0 v8	2021-06-13	16	11.1002/1000/14658
8.1	ITU-T H.222.0 v8 (2021) Cor. 1	2022-12-14	16	11.1002/1000/15172
8.2	ITU-T H.222.0 v8 (2021) Amd. 1	2022-12-14	16	11.1002/1000/15171
9.0	ITU-T H.222.0 v9	2023-08-29	16	11.1002/1000/15655
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Keywords

Audiovisual content, multimedia multiplexing, MPEG-2 system, multiplexed bit stream, program stream, transport stream.