



ATSC

ADVANCED TELEVISION
SYSTEMS COMMITTEE

ATSC Candidate Standard: A/341 Amendment: Picture Timing Information

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Advanced Television Systems Committee
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The Advanced Television Systems Committee, Inc., is an international, non-profit organization developing voluntary standards for digital television. The ATSC member organizations represent the broadcast, broadcast equipment, motion picture, consumer electronics, computer, cable, satellite, and semiconductor industries.

Specifically, ATSC is working to coordinate television standards among different communications media focusing on digital television, interactive systems, and broadband multimedia communications. ATSC is also developing digital television implementation strategies and presenting educational seminars on the ATSC standards.

ATSC was formed in 1982 by the member organizations of the Joint Committee on InterSociety Coordination (JCIC): the Electronic Industries Association (EIA), the Institute of Electrical and Electronic Engineers (IEEE), the National Association of Broadcasters (NAB), the National Cable Telecommunications Association (NCTA), and the Society of Motion Picture and Television Engineers (SMPTE). Currently, there are approximately 150 members representing the broadcast, broadcast equipment, motion picture, consumer electronics, computer, cable, satellite, and semiconductor industries.

ATSC Digital TV Standards include digital high definition television (HDTV), standard definition television (SDTV), data broadcasting, multichannel surround-sound audio, and satellite direct-to-home broadcasting.

Note: The user's attention is called to the possibility that compliance with this standard may require use of an invention covered by patent rights. By publication of this standard, no position is taken with respect to the validity of this claim or of any patent rights in connection therewith. One or more patent holders have, however, filed a statement regarding the terms on which such patent holder(s) may be willing to grant a license under these rights to individuals or entities desiring to obtain such a license. Details may be obtained from the ATSC Secretary and the patent holder.

This specification is being put forth as a Candidate Standard by the TG3/S34 Specialist Group. This document is a revision of the Working Draft S34-281r0 dated 27 September 2017. All ATSC members and non-members are encouraged to review and implement this specification and return comments to cs-editor@atsc.org. ATSC Members can also send comments directly to the TG3/S34 Specialist Group. This specification is expected to progress to Proposed Standard after its Candidate Standard period.

Revision History

Version	Date
Candidate Standard approved	6 November 2017
CS Update approved	15 December 2017
Standard approved	Insert date here

Table of Contents

1. OVERVIEW.....	1
2. REFERENCES	1
2.1 Normative References	1
3. DEFINITION OF TERMS	1
4. CHANGES TO A/341	1
4.1 Amend Section 6.4	1
4.2 Add a New Subsection (6.4.4) under Section 6.4	1

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1. OVERVIEW

This document describes constraints on HEVC streams redistributed to viewers over MVPD systems in regards to carriage of HEVC Picture Timing SEI messages as documented in ANSI/SCTE 215-1 “HEVC Video Constraints for Cable Television Part 1-Coding”. If approved by the ATSC, A/341:2017, “Video-HECV,” (“A/341”) would be amended according to the edits described herein.

2. REFERENCES

The following references would be added to A/341.

2.1 Normative References

- [1] SCTE: “HEVC Video Constraints for Cable Television Part 1-Coding” Doc. ANSI/SCTE 215-1 2015, Society of Cable Telecommunications Engineers, Exton, PA.

3. DEFINITION OF TERMS

The following abbreviations or terms would be added to A/341.

CVS – Coded Video Sequence

4. CHANGES TO A/341

In this section of this document, “[ref]” indicates that a cross reference to a cited referenced document that is listed in A/341 would be inserted (or as otherwise described within the square brackets). An actual cross reference to a referenced document listed in this document would be updated with the reference number of the newly added references that would be incorporated into A/341.

Change instructions are shown in *italics*. New (inserted) text is shown in **blue**.

4.1 Amend Section 6.4

Replace the first paragraph of Section 6.4 of A/341 with the following text.

“This section covers the specific data carried in the SEI and VUI sections of the video syntax of CVS (Coded Video Sequences) streams. The syntax used for the insertion of AFD and Bar Data, Carriage of Closed Captions, or Picture Timing Information in the SEI payload shall be as specified in the following sections.”

Remove Footnote 7 in Section 6.4.

4.2 Add a New Subsection (6.4.4) under Section 6.4

The text below would be added to A/341 as a new Section 6.4.4, to be placed after Section 6.4.3.

“6.4.4 Carriage of Picture Timing Information with Coded Pictures

ATSC broadcasts may carry streams originated from mixed source types (e.g., interlace, progressive, frame repeated signals), in which case consistent availability of the Picture Timing Information SEI message at the decoder is necessary for the rendering engine to display decoded

pictures correctly. In addition, in some regions these broadcast signals are likely to be redistributed to viewers by MVPD networks using the SCTE suite of standards, which requires that the Picture Timing Information SEI be sent with each coded picture. The `pic_struct`, `source_scan_type`, `duplicate_flag` and other elements contained within the Picture Timing SEI message indicate whether a picture should be displayed as a frame, duplicate frames, or as one or more fields.

Picture Timing Information shall be carried within a prefix Picture Timing Information SEI message for each coded picture as specified in section 7.1.7 of ANSI/SCTE 215-1 [ref], and the `frame_field_info_present_flag` in the VUI shall be set to 1 as specified in section 7.1.5 of ANSI/SCTE 215-1 [ref]. In a single layer CVS stream, this is a single prefix SEI message associated with every coded picture. In a scalable stream, this is a single prefix SEI message associated with every coded picture in the base layer stream.

Note (informative): Legacy deployments may exist which involve homogeneous source signal (e.g., progressive only) services, and in which no receiving entities in the ecosystem require the Picture Timing Information SEI message. Receiver implementations will ideally be able to decode streams that include Picture Timing Information SEI messages (legacy receivers may “gracefully ignore” the messages) and streams that do not include Picture Timing Information SEI messages.

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