RP 212-2002

SMPTE RECOMMENDED PRACTICE

Ancillary Data Mapping over MPEG-2 Video Elementary Stream Editing Information

1 Scope

This practice defines the mapping of vertical ancillary (V-ANC) data packets within MPEG-2 video elementary streams conforming to the framework provided by SMPTE 328M.

The purpose of this practice is to provide a method of mapping V-ANC data packets through the 8-bit interface provided by SMPTE 328M and to provide guidance for data coding to prevent the false creation of MPEG-2 video elementary stream start marker bit sequences.

Although this practice refers to bit-serial interfaces, the description can be equally applied to the equivalent parallel interfaces.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this practice. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this practice are encouraged to investigate the possibility of applying the most recent edition of the standards indicated below.

SMPTE 291M-1998, Television — Ancillary Data Packet and Space Formatting

SMPTE 328M-2000, Television — MPEG-2 Video Elementary Stream Editing Information

3 General

This practice defines the mapping of vertical ancillary (V-ANC) data packets within the framework provided by SMPTE 328M.

SMPTE 291M defines the basic structure of ancillary data packets in the form of 10-bit words. SMPTE 291M defines ancillary data packets for use in both the horizontal blanking interval (H-ANC) and the vertical blanking interval (V-ANC). This practice only provides a mapping for V-ANC data packets.

V-ANC packets can carry many kinds of data including those defined in SMPTE 334M, SMPTE RP 214, and other specifications which define V-ANC packet payloads.

The MPEG-2 video elementary stream (video-ES) can be supplemented with additional information for professional studio applications according to SMPTE 328M. This supplementary information is carried within the sequence header and the user data area of the MPEG-2 video-ES to facilitate seamless edits under

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circumstances defined in SMPTE 328M. This practice specifies that V-ANC packets be placed into the space assigned as ancillary data in the MPEG-ES syntax as defined by SMPTE 328M. The ancillary data are based on an 8-bit interface.

The 10-bit word structure of SMPTE 291M is not appropriate for an 8-bit interface. While annex A of SMPTE 291M provides guidance for 8-bit operation, the result is unnecessarily restrictive and a simpler solution is defined in this practice. It should be noted that while the internal operation in the MPEG-2 video-ES stream is 8-bits, the input and output interfaces of SDI operate with the full 10-bit resolution.

4 Data structure

The V-ANC data packet shall be mapped onto the ancillary data payload of the ES editing information as follows.

a) The data_ID of the MPEG-ES syntax, as defined in SMPTE 328M, shall be set to the value 07_h in conformance with that standard.

b) The ADF (ancillary data flag) words of each SMPTE 291M packet shall be mapped only from bits b0 to b7. Bits b8 and b9 of the ADF shall be discarded.

c) The DID, SDID/DBN, DC, and UDW words of SMPTE 291M shall be mapped following the ADF. Bits b8 and b9 shall be discarded.

d) The CS (checksum) word of SMPTE 291M shall be recalculated from the 8-bit DID word through the 8-bit UDW words with 8-bit accuracy.

e) In compliance with SMPTE 291M, the ancillary packets shall be mapped contiguously with each other into the payload area of the MPEG_ES_editing_information space as defined by SMPTE 328M.

f) As the resulting 8-bit ancillary data bit-stream may consist of more than 23 consecutive zeroes, a marker bit shall be inserted every 22 bits according to SMPTE 328M.

g) If the value of ancillary data length in the MPEG-ES editing information is greater than the actual data length of all the packets, the unused bits shall be set to a value of 1.

The full 10-bit V-ANC packet data structure shall be recreated at the output, including the recalculation of the 10-bit CS (checksum), to meet the 10-bit interface specification of SMPTE 291M.

Figure 1 shows the input V-ANC data packet structure of this practice. V-ANC packets may be either type 1 or type 2 as defined in SMPTE 291M.

Figure 2 shows the mapping of the V-ANC data packets to 8-bits and padded with marker bits as defined by SMPTE 328M.

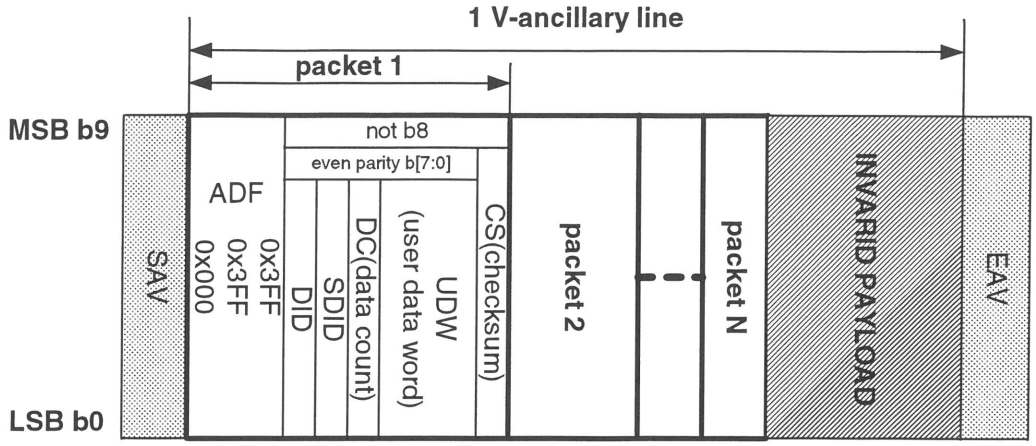

Figure 1 – Input V-ANC data packet structure

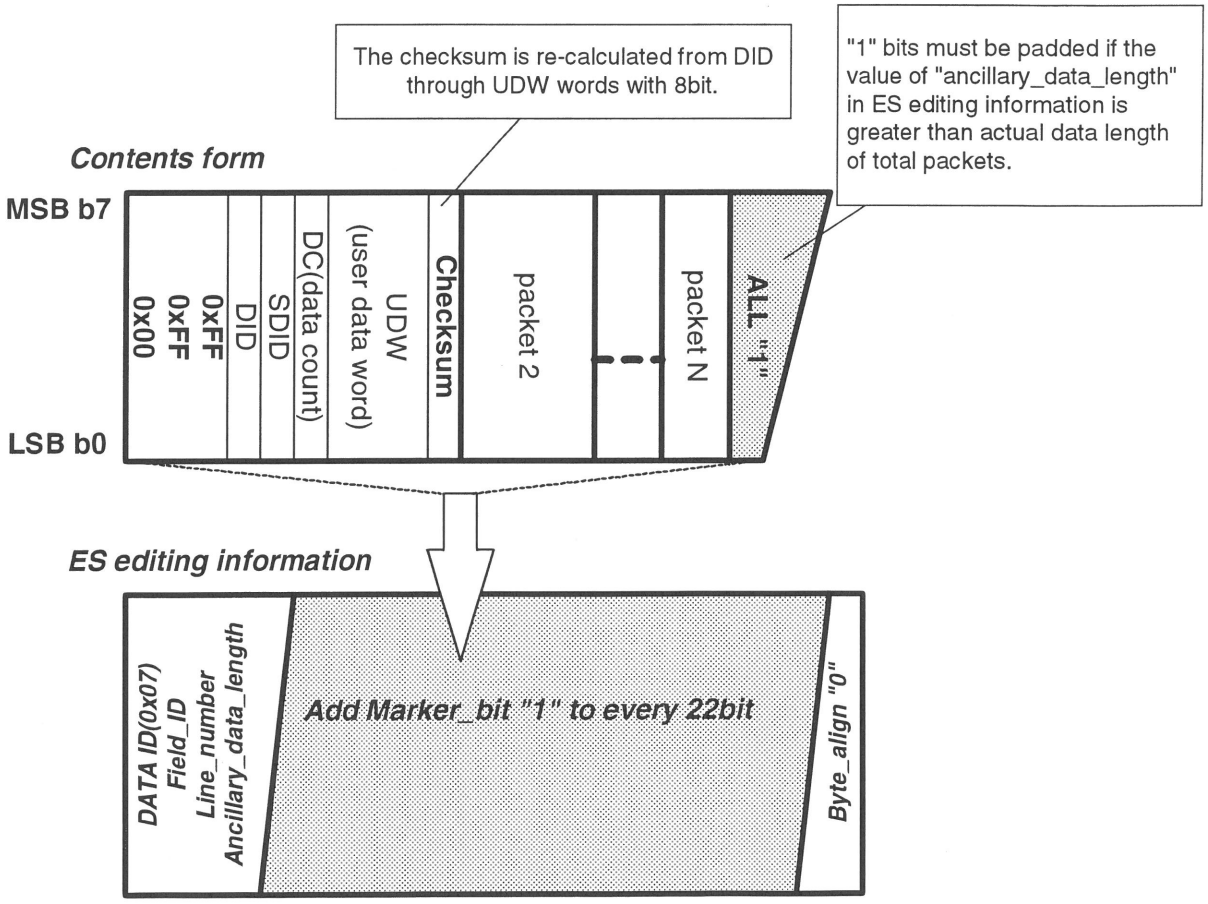

Figure 2 – Mapping V-ANC data packets in conformance with SMPTE 328M

Annex A (informative)
Bibliography

SMPTE 334M-2000, Television — Vertical Ancillary Data Mapping for Bit-Serial Interface

SMPTE RP 214, Packing KLV Encoded Metadata and Data Essence into SMPTE 291M Ancillary Data Packets