ATSC Standard:
Carriage of Legacy TV Data Services

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Advanced Television Systems Committee, Inc.
1750 K Street, N.W., Suite 1200
Washington, D.C. 20006

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Mailing address	Advanced Television Systems Commmittee, Inc. 1750 K Street, N.W., Suite 1200 Washington, D.C. 20006
Telephone	202-872-9160 (voice) 202-872-9161 (fax)
Web site	http://www.atsc.org
E-mail	standards@atsc.org

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The revision history of this document is given below.

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1. SCOPE

This supplementary standard establishes how to transport certain data services that are sent by some broadcasters. These services may be sent over NTSC using lines in or near the Vertical Blanking Interval or in digital video using VANC. The method for encapsulating some of these services has been defined in SCTE 127.

1.1 Introduction and Background

This standard establishes a tool intended to help manage technological change by enabling the continuance of optional services using the digital transport. ANSI/SCTE 127 was developed to establish how to transport certain data services that classically were sent using the Vertical Blanking Interval (VBI) or the lines immediately following VBI in NTSC by documenting their encoding and use of Packetized Elementary Streams. SMPTE 2031 then standardized placement of this data within the VANC space of a digital video signal, permitting their use with HD. This standard establishes how these streams may optionally be placed in an ATSC Transport in a standard manner.

1.2 Organization

This document is organized as follows:

- **Section 1** – Outlines the scope of this document and provides a general introduction.
- **Section 2** – Lists references and applicable documents.
- **Section 3** – Provides a definition of terms, acronyms, and abbreviations for this document.
- **Section 4** – Establishes the method of transport of defined data services.

2. REFERENCES

At the time of publication, the editions indicated below were valid. All standards are subject to revision, and parties to agreement based on this standard are encouraged to investigate the possibility of applying the most recent editions of the documents listed below.

2.1 Normative References

The following documents contain provisions which, through reference in this text, constitute provisions of this standard.

[1] IEEE: "Use of the International Systems of Units (SI): The Modern Metric System", Doc. IEEE/ASTM SI 10-2002, Institute of Electrical and Electronics Engineers, New York, N.Y., 2002.

[2] ANSI/SCTE 127:2007 "Carriage of Vertical Blanking Interval (VBI) Data in North American Digital Television Bitstreams," Society of Cable Telecommunications Engineers, Exton, P.A., 2007.

2.2 Informative References

[3] SMPTE 2031-2007, "Carriage of DVB/SCTE VBI Data in VANC," Society of Motion Picture and Television Engineers, White Plains, N.Y., 2007.

[4] ETSI 300 472 v1.3.1 (2003-01), "Digital Video Broadcasting (DVB); Specification for conveying ITU-R System B Teletext in DVB bitstreams"

[5] ATSC: "ATSC Standard: Program and System Information Protocol for Terrestrial Broadcast and Cable (Revision C) with Amendment No. 1," Doc. A/65C, Advanced Television Systems Committee, Washington, D.C., 2 January 2006 (Amendment No. 1 dated 9 May 2006).

3. DEFINITION OF TERMS

With respect to definition of terms, abbreviations, and units, the practice of the Institute of Electrical and Electronics Engineers (IEEE) as outlined in the Institute's published standards [1] shall be used. Where an abbreviation is not covered by IEEE practice or industry practice differs from IEEE practice, the abbreviation in question will be described in Section 3.2 of this document.

3.1 Compliance Notation

As used in this document, "shall" denotes a mandatory provision of the standard. "Should" denotes a provision that is recommended but not mandatory. "May" denotes a feature whose presence does not preclude compliance, which may or may not be present at the option of the implementer.

3.2 Treatment of Syntactic Elements

This document contains symbolic references to syntactic elements used in the audio, video, and transport coding subsystems. These references are typographically distinguished by the use of a different font (e.g., restricted), may contain the underscore character (e.g., sequence_end_code) and may consist of character strings that are not English words (e.g., dynrng).

3.3 Acronyms and Abbreviation

The following acronyms and abbreviations are used within this specification.

ATSC – Advanced Television Systems Committee.

ISO – International Standards Organization.

MPEG – Moving Picture Experts Group.

VBI – An acronym for Vertical Blanking Interval, which is composed of the first 21 horizontal lines in each NTSC field. These lines are not intended to be directly displayed by a receiver. In digital systems, the VBI does not exist.

VANC – An acronym for Vertical ANCillary. In a broadcast facility, in uncompressed SDI, the Vertical ANCillary (VANC) data space is used for VBI and other non-video signals.

4. VERTICAL BLANKING INTERVAL DATA SERVICES

The VBI data Program Elements, each comprised of data structures and fields as defined in ANSI/SCTE 127:2007 [2], are optional elements for the ATSC system. When one or more

Program Elements is present each shall be transported and encoded as described in ANSI/SCTE 127 [2].

Note: The term "VBI data" is historical and not necessarily descriptive of data carried as an optional auxiliary element in a DTV system. The payloads specified in ANSI/SCTE 127 [2] can enter an ATSC broadcast facility from:

- encoders with NTSC (analog) input, or
- distribution MPEG-2 Transport Streams with ANSI/SCTE 127 [2] already encoded, or
- in SDI/HD-SDI VANC encoded per SMPTE 2031[3]

Note: Some signals carried by ANSI/SCTE 127 [2] are actually placed in the top two lines of active video within an NTSC signal. This was done intentionally, since historically, a number of common devices (tape decks and processing amplifiers) would strip all of the VBI lines.

Note: The PMT stream_type is set to 0x06 as provided by ETSI EN 300 472, referenced by SCTE 127.

Note: When a Program Element is sent as part of a Virtual Channel, the required PMT information is reproduced in the service_location_descriptor as provided in A/65, Section 6.9.5.

Note: It is expected that the SCTE 127 stream will be part of a "normal" digital television service (e.g. service_type 2). Uses with other service_type values or in a data-only minor channel, although not forbidden, are not defined here.

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