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## S T A N D A R D S

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**Digital Video Subcommittee**

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**Emergency Alert Metadata Descriptor**

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# Emergency Alert Metadata Descriptor

## 1.0 SCOPE AND INTRODUCTION

This document defines a container usable by cable system operators for the delivery of Emergency Alert (EA) metadata into the consumer domain. This metadata is designed to support cable set-top terminals which function as servers of “commercial video services” (CVS) into the home network, by providing preformatted XML-based EA data required by such Digital Media Servers (DMS) in the home. The container, specified as being in the form of an ANSI J-STD-042-B [2] descriptor, is defined only for carriage within the emergency alert signaling message defined in ANSI J-STD-042-B [2]. The metadata carried in the descriptor includes metadata elements conforming to ANSI J-STD-070 [1], which is the standard delivery format for XML-formatted EA data in the home network.

Users of this standard should be aware that EAS is a topic which is subject to regulation and is currently under consideration by the Federal Emergency Management Agency (FEMA).

## 2.0 NORMATIVE REFERENCES

The following documents contain provisions, which, through reference in this text, constitute provisions of the standard. At the time of Subcommittee approval, the editions indicated were valid. All standards are subject to revision; and while parties to any agreement based on this standard are encouraged to investigate the possibility of applying the most recent editions of the documents listed below, they are reminded that newer editions of those documents may not be compatible with the referenced version.

- [1] ANSI J-STD-070, Emergency Alert Signaling for the Home Network, a Joint Standard developed by SCTE {published as ANSI/SCTE 162 2009} and CEA {published as CEA 2035}.)
- [2] ANSI J-STD-042-B Emergency Alert Messaging for Cable, a Joint Standard developed by SCTE {published as ANSI/SCTE 18 2013} and CEA {published as CEA 814-B}.)

## 3.0 COMPLIANCE NOTATION

Throughout this document, there are words that are used to define the significance of particular requirements. These words are:

“shall”	This word or the adjective “REQUIRED” means that the item is an absolute requirement of this specification.
“shall not”	This phrase means that the item is an absolute prohibition of this specification.
“should”	This word or the adjective “RECOMMENDED” means that there may exist valid reasons in particular circumstances to ignore this item, but the full implications should be understood and the case carefully weighted before choosing a different course.
“should not”	This phrase means that there may exist valid reasons in particular circumstances when the listed behavior is acceptable or even useful, but the full implications should be understood and the case carefully weighed before implementing any behavior described with this label.
“may”	This word or the adjective “OPTIONAL” means that this item is truly optional. One vendor may choose to include the item because a particular marketplace requires it or because it enhances the product, for example; another vendor may omit the same item.
“forbidden”	The value specified shall never be used.

This document contains symbolic references to syntactic elements used in the video and transport coding subsystems. These references are typographically distinguished by the use of a different font (e.g., reserved), may contain the underscore character (e.g., constraint\_set0\_flag) and may consist of character strings that are not English words (e.g., pic\_width\_in\_mbs\_minus1).

## 4.0 DEFINITIONS AND ACRONYMS

### 4.1 Acronyms

The following definitions and acronyms are used in this document:

ANSI	American National Standards Institute
ATIS	Association for Telecommunications Industry Solutions
CEA	Consumer Electronics Association
DMS	Digital Media Server
DTV	Digital Television
EA	Emergency Alert
EAS	Emergency Alert System
IEC	International Electrotechnical Commission
IIF	IPTV Interoperability Forum
IP	Internet Protocol
IPTV	IP Television
STB	Set Top Box
UCS	Unicode Conversion Support
uimsbf	unsigned integer most significant bit first
UTF-8	8-bit UCS/Unicode Transformation Format
XML	eXtensible Markup Language

### 4.2 Numerical Formats

This document uses the conventions shown in Table 1 for the representation of numerical values.

**Table 1. Numerical Format Definitions**

<b>Example Values</b>	<b>Description</b>
12345	Example of a decimal value format
0x2A	Example of a hexadecimal value format
'10010100'	Example of a string of binary digits

## 5.0 EMERGENCY ALERT METADATA DESCRIPTOR (NORMATIVE)

This section normatively defines the syntax and semantics of the Emergency Alert Metadata Descriptor, and specifies normative requirements for its contents.

The bit stream syntax of the Emergency Alert Metadata Descriptor shall be as shown in Table 2. When used, one or more instances of this descriptor shall appear in the `cable_emergency_alert()` data structure defined in ANSI J-STD-042- [2], each as an instance of `descriptor()`.

**Table 2. Emergency Alert Metadata Descriptor Bit Stream Syntax**

Syntax	Bits	Format
EA_metadata_descriptor() {		
descriptor_tag	8	0x03
descriptor_length	8	uimsbf
fragment_number	8	uimsbf
fragment_length	8	uimsbf
XML_fragment	var	
}		

**descriptor\_tag** – This 8-bit unsigned integer field shall be set to 0x03 to identify the descriptor as being the Emergency Alert Metadata Descriptor in the context of its carriage within the `cable_emergency_alert()` data structure defined in ANSI J-STD-042-B [2].

**descriptor\_length** – This 8-bit unsigned integer shall specify the number of bytes following the descriptor\_length itself.

**fragment\_number** – This 8-bit unsigned integer field shall indicate the number of the fragment of XML data carried in this instance of the descriptor. The value of `fragment_number` shall be in the range 1 to 255, although the maximum number of descriptors actually usable is limited by the overall length of the `cable_emergency_alert()` table section (4096 bytes) and the available descriptor space.

**fragment\_length** – This 8-bit unsigned integer field shall be in the range 1 to 253 and shall indicate the number of bytes in the `XML_fragment` field to follow.

**XML\_fragment** – This variable-length field shall contain a fragment of XML-formatted text encoded as UTF-8 comprising a portion of an XML instance document conforming to the XML schema defined in ANSI J-STD-070 [1], with the following additional constraints:

1. The **AlertText** element for the English language, if alert text is to be delivered in the home network EA metadata, shall be present as a placeholder only. When used as a placeholder, the **AlertText** element shall consist of the text “<AlertText></AlertText>.” No new line or white space characters shall appear between “<AlertText>” and “</AlertText>.”

NOTE: **AlertText** may be supplied in languages other than English. The receiving device is not expected to alter **AlertText** supplied for non-English languages.

2. Each `XML_fragment` shall contain XML data that, when reassembled in the receiver with other fragments in the order indicated by `fragment_number`, forms a valid XML instance document containing **EASMetadata** compliant with the EAS signaling message specified in ANSI J-STD-070 [1].
3. The `XML_fragment` with `fragment_number` value 1 (the first fragment) shall start with the first line of the XML instance file.
4. The last character of the last fragment shall end with the last character of the XML file (a closing triangular bracket).

Except for the first character of the first fragment and the last character of the last fragment, a fragment is not required to start or end at the beginning or end of an element tag or end-of-line.

Where **AlertText** appears in the XML file only as a placeholder, the receiving device is expected to insert `alert_text()` derived from text provided in the ANSI J-STD-042-B [2] cable Emergency Alert signaling message into the XML instance document before it is delivered into the home network.

Note that the XML-formatted EA data defined in ANSI J-STD-070 [1] may support multiple languages—e.g. multiple instances of **AlertText** may be present for any given alert, with the language indicated by the **Language** element. ANSI J-STD-042-B [2] also may supply alert text in multiple languages. To simplify processing in the receiving device, only English-language **AlertText** may be specified as a null string, to be filled in from `alert_text()` data supplied in the ANSI J-STD-042-B [2] message.

## 6.0 PROCESSING IN THE RECEIVING DEVICE (INFORMATIVE)

Figure 1 diagrams the expected processing of an incoming Cable Emergency Alert Message compliant with ANSI J-STD-042-B [2] containing a number of Emergency Alert Metadata Descriptors. The diagram shows the delivery of the data defined in the ANSI J-STD-042-B [2] standard, identified as Alert info (1), `alert_text()`, and Alert info (2).

Alert info (1) consists of the data fields preceding `alert_text()`:

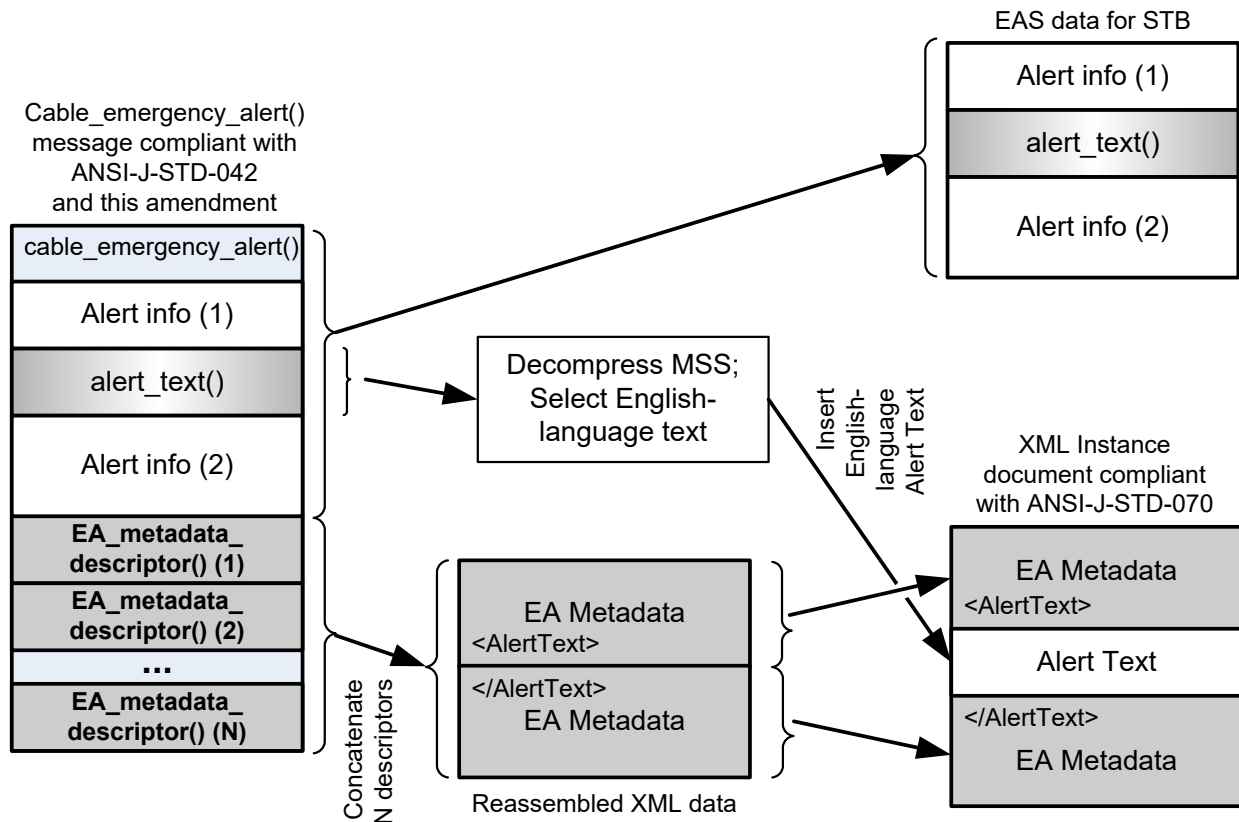
- `EAS_event_ID`
- `EAS_originator_code`
- `EAS_event_code_length`
- `EAS_event_code`
- `nature_of_activation_text()`
- `alert_message_time_remaining`
- `event_start_time`, `event_duration`
- `alert_priority`, `details_OOB_source_ID`
- `details_major_channel_number`
- `details_minor_channel_number`
- `audio_OOB_source_ID`.

Alert info (2) consists of the data fields following `alert_text()`: location codes (if any), and Exception Channels list (if any).

The steps involved in creating an XML instance document usable for home network signaling of Emergency Alerts include:

1. Extract the EA Metadata Descriptors from the Cable Emergency Alert Message.
2. Starting with `fragment_number` 1, extract and concatenate the `XML_fragment` payloads in order of increasing values of `fragment_number`.
3. Parse the assembled XML to try to locate an instance of an **AlertText** metadata element with a null string. Note: in some instances no **AlertText** element will be present; in other instances a string will already be provided. In these cases, no substitution of `alert_text()` is needed.





**Figure 1. EA Data Processing Example**

4. If an **AlertText** metadata element with a null string is found:
  - a. Process the `alert_text()` data provided in the Cable Emergency Alert Message to form a regular UTF-8 character string, by selecting the English-language substring and decompressing the Huffman-coding that may be present in the Multiple String Structure.
  - b. Insert the resulting text string into the null-string **AlertText** metadata element.
5. Depending upon the implementation of the Digital Media Server in the home network, pointers to Details Channels, Exception Channels, and audio files may need to be changed. This processing, if required, is outside the scope of this document.