PROPOSED RP 217
SMPTE RECOMMENDED PRACTICE

Nonsynchronized Mapping of KLV Packets into MPEG-2 Systems Streams

1 Scope

This practice describes a means for mapping SMPTE metadata and other data essence, encoded in the SMPTE KLV protocol, into MPEG-2 systems streams. Use of synchronized streams and their syntax and semantics is beyond the scope of this practice.

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 336M-2001, Television — Data Encoding Protocol using Key-Length-Value

ITU-T H.222.0 / ISO/IEC 13818-1:2000, *Information* Technology — Generic Coding of Moving Pictures and Associated Audio Information: Systems

3 Introduction

This practice describes a means for mapping SMPTE metadata and/or essence encoded in the SMPTE 336M KLV protocol into MPEG-2 systems streams. A strong interest exists to carry audio/visual data, metadata, and/or essence multiplexed together within the same digital stream. The use of one data stream facilitates delivery of the overall multimedia presentation to the consumer. Metadata is classified as information about the content or essence. An example of metadata is information such as camera angle, scene identifier, or property rights. Other essence is supplemental content to the audio and video such as closed captioning, sports statistics, or hyperlinked advertisements.

For some applications, it may not be appropriate for large amounts of data essence and metadata to be mixed together in the same stream. For example, applications intended for simple realtime decoders may wish to carry data essence and metadata in separate streams using the specifications in this practice.

4 Transport and program stream mapping

The MPEG-2 systems specification describes a transport stream and a program stream. The transport stream is tailored for communicating or storing one or more programs of coded video and other data in environments where significant errors may occur. Examples include wireless communications, broadcast, and Internet delivery. Alternatively, the program stream is tailored for communicating or storing one *program of coded video and other data in environ*ments where errors are very unlikely. Examples include DVD, video archives, Intranet, and FTP.

Both protocols allow for the multiplexing of other data with the audio and video stream.

The MPEG-2 systems stream protocol is primarily a methodology for multiplexing multiple streams of audio/visual/data information into a single program. Data may be carried in MPEG-2 systems streams similar to the way video and audio data are carried.

The value of the ISO/IEC 13818-1 *stream_id* field associated with an SMPTE KLV program element shall be equal to 0xBD (private_stream_1).

PROPOSED RP 215
SMPTE RECOMMENDED PRACTICE

Encoding Film Transfer Information into Vertical Ancillary Data for SMPTE 292M Bit-Serial Interface

1 Scope

This practice specifies a method of encoding video tape time code, film edge numbers, production time code, and other production data into the vertical ancillary data space of a bit-serial high-definition component television signal conforming with SMPTE 292M. This practice is intended for use in post-production as a means of conveying the essential elements that define the film-to-tape transfer. Normally this information is not intended for inclusion in the released program.

Despite the reference to SMPTE 292M, nothing in this specification precludes its use in a parallel digital interface for component digital HDTV signals.

2 Normative references

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

ANSI/SMPTE 270-1994, Motion-Picture Film (65-mm) — Manufacturer-Printed Latent Image Identification Information

ANSI/SMPTE 271-1994, Motion-Picture Film (16-mm) — Manufacturer-Printed Latent Image Identification Information

SMPTE 12M-1999, Television, Audio and Film —Time and Control Code

SMPTE 254-1998, Motion-Picture Film (35-mm) — Manufacturer-Printed Latent Image Identification Information

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

SMPTE 292M-1998, Television — Bit-Serial Digital Interface for High-Definition Television Systems

SMPTE 309M-1999, Television — Transmission of Date and Time Zone Information in Binary Groups of Time and Control Code

SMPTE 313-1999, Motion-Picture Film (65-mm) — Manufacturer-Printed Latent Image Identification Information — 120 Perforation Repeat

SMPTE RP 135-1999, Use of Binary User Groups in Motion-Picture Time and Control Codes

SMPTE RP 195-1998, Use of the Reference Mark in Manufacturer-Printed Latent Image Key Numbers for Unambiguous Film Frame Identification

SMPTE RP 201-1999, Encoding Film Transfer Information Using Vertical Interval Time Code

ISO/IEC 646:1991, Information Technology — ISO 7-Bit Coded Character Set for Information Exchange

ISO/IEC 2022:1994, Information Technology — Character Code Structure and Extension Techniques

3 Relationship to existing recommended practices

SMPTE RP 201 specifies a method of encoding video and production time code and film edge number information into standard definition video using vertical interval time code. This practice provides the mapping of these data and data required in the high-definition post-production flow into the SMPTE 292M video bit-stream using SMPTE 291M ancillary data packets. Encoding in this practice has been designed to have a maximum data rate requirement of 215 bytes per

PROPOSED **EG 37**
SMPTE ENGINEERING GUIDELINE

Node Structure for the SMPTE Metadata Dictionary

1 Scope

This guideline provides supplementary information to the SMPTE metadata dictionary. The metadata dictionary is a complete list of metadata elements identified by the last 8 octets of the SMPTE universal label (UL). The UL defines a tree structure with a multiplicity of branches (called nodes) and the metadata items are defined as leaves. The dictionary specifies which ULs are nodes and which are leaves.

This guideline provides a simplified layout of the metadata dictionary nodes for easy reference. This layout is not a normative reference, but provides sufficient information in a compact form to allow users to both locate metadata items of interest and to provide an easy tool by which new metadata items can be placed within the metadata dictionary.

2 Normative references

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

ANSI/SMPTE 298M-1997, Television — Universal Labels for Unique Identification of Digital Data

SMPTE 335M, Television — Metadata Dictionary Structure

SMPTE RP 210-2001, Metadata Dictionary

3 Node description

The metadata dictionary register identifies each metadata item with the last 8 octets of the 16-octet SMPTE UL called the item designator. The dictionary is constructed of primary classes as identified in SMPTE 335M (metadata dictionary structure) and subclasses of increasingly fine node definition. The primary classes are defined by the first octet in the dictionary item designator and subclasses are defined by second, third, and fourth octets up to the eighth octet. Node break points are defined by the rightmost octet prior to that which is used to define an individual metadata item. Thus a node appears at each point in the dictionary item designator where one or more metadata items with a common node are defined.

The metadata dictionary includes a column identifying whether a row is a node or a leaf. All leaf rows define metadata items whereas all nodes define the common path for related metadata items. This guideline specifies the node layout in a simple form for ease of access and understanding.

The metadata dictionary register is identified by the first 8 octets of a SMPTE 16-octet UL in which octets 7 and 8 identify the dictionary structure number and version number respectively. A metadata dictionary register has the same value for octet 7 and may have incrementing version numbers defined in octet 8 where each increment only adds nodes and leaves and is therefore backward compatible with previous version numbers of that dictionary. Metadata dictionary register with different dictionary structure numbers defined in octet 7 are non-backward compatible with dictionary registers having other dictionary structure numbers.

This guideline identifies the node structure of the metadata dictionary register indicated in octets 7 and 8 in table 1.

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