

IEC/PAS 62261

Edition 1.0
2001-07

**Television –
Metadata Dictionary Structure**

PUBLICLY AVAILABLE SPECIFICATION



INTERNATIONAL
ELECTROTECHNICAL
COMMISSION



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INTERNATIONAL ELECTROTECHNICAL COMMISSION

TELEVISION – METADATA DICTIONARY STRUCTURE

FOREWORD

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A PAS is a technical specification not fulfilling the requirements for a standard, but made available to the public and established in an organization operating under given procedures.

IEC-PAS 62261 was submitted by the SMPTE (Society of Motion Picture and Television Engineers) and has been processed by IEC technical committee 100: Audio, video and multimedia systems and equipment.

The text of this PAS is based on the following documents:

Draft PAS	Report on voting
100/234/PAS	100/246/RVD

Following publication of this PAS, the technical committee concerned will investigate the possibility of transforming the PAS into an International Standard.

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PROPOSED SMPTE STANDARD

SMPTE 335M

for Television — Metadata Dictionary Structure

Page 1 of 7 pages

1 Scope

The metadata dictionary structure defined in this standard covers the use of metadata for all types of essence (video, audio, and data in their various forms). Applications of individual dictionary entries will vary but, when used, metadata shall conform to the definitions and formats in this metadata dictionary structure standard and the associated metadata dictionary recommended practice (SMPTE RP 210). SMPTE RP 210 defines a registered set of metadata element descriptions for association with essence or other metadata and this standard and the contents practice shall be used together as a pair — neither shall be used in isolation.

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

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

SMPTE 359M-2001, Television and Motion Pictures — Dynamic Documents

SMPTE RP 210.1-2001, Metadata Dictionary

3 Metadata dictionary structure

The metadata dictionary structure provides flexibility in capturing metadata and exchanging it among applications through a standardized hierarchy of universal labels for the metadata elements, grouped to aid their management within a small but comprehensive number of classes. Metadata classes are collections of metadata elements with common characteristics or attributes. Additional classes are provided for user-defined metadata.

SMPTE RP 210 references an individual item or element of metadata using a two-part 16-byte universal label that is numerical (and hence language independent) and unique. The first eight bytes label the second as a tag in a specific version of a designated metadata dictionary (tags are defined in SMPTE 336M). This tag is used to index the meaning or definition of the metadata element.

The actual metadata information described by the metadata element is the metadata value. The dictionary also contains information on the required format of metadata values and the allowable range of values (if applicable) either as a list or as a bounded range.

Individual data element values can frequently be represented in more than one way — for instance, it is possible to represent a textual value as ASCII or Unicode, where the value is identical but the particular representation different. It is important both that the representation is known and that as new representations are registered they can be accommodated. In this case, the last active word of the tag defines the representation in use — the default being 00_h.

The metadata dictionary is organized into nodes and leaves. The dictionary classes just described form class nodes and below these are further nodes at each subclass. To aid the management of the dictionary, these nodes and subnodes are assigned tags to which no value is assigned, so as to give clear breaks in the structure. Entries within a subclass form leaves, which are the data elements themselves.

Lower levels of the dictionary structure can be derived from the tag structure in SMPTE RP 210 and are detailed in SMPTE EG 37.

3.1 Compatibility with other metadata structures

The metadata dictionary structure is a framework that supports global interoperability by defining metadata tags in a way that enables the interchange of SMPTE metadata with metadata from different sources and originated by other bodies.

Many different cataloging conventions are used by communities who focus on a specific domain or subject or who have specific needs for archive and retrieval of multimedia data including, for example, intellectual rights. The metadata dictionary is not intended to replace conventions already in use, for example in textual naming or keywords. Within the framework of the metadata dictionary structure, different content creation communities, media indexing profes-

sionals, or metadata extractors and users can develop metadata conventions that meet their specific requirements.

3.2 Individual metadata classes

Within the metadata dictionary, metadata elements are organized into a hierarchical structure, where each is assigned to a metadata class as shown in the overview of figure 1. The initial set of metadata classes in this standard consists of:

- Class 1: Identification and location
- Class 2: Administration
- Class 3: Interpretive
- Class 4: Parametric
- Class 5: Process
- Class 6: Relational
- Class 7: Spatio-temporal
- Class 13: Organizationally registered for public use
- Class 14: Organizationally registered as private
- Class 15: Experimental

The number of metadata classes can be extended in the future to a maximum of 127. Although dictionary classes can be populated with any metadata (such as that associated with still images, audio, graphics, etc.), additional new classes may be created up to that limit to deal with specific metadata characteristics or attributes.

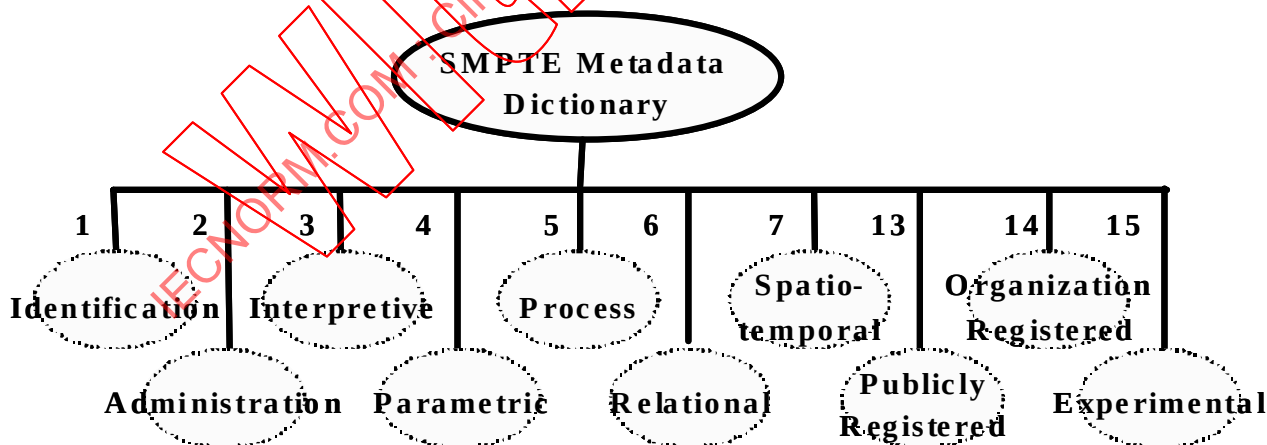


Figure 1 – Metadata class structure

3.2.1 Class 1: Identification and location

Metadata in this class shall consist of identifying information (IDs) that describes the essence of the overall bit stream or file. A critical part of class 1 metadata is unambiguous identification of the essence using a single, recognized number or label such as the SMPTE unique material identifier (SMPTE 330M). Information in this class shall include global and local identifiers as well as identifying information about the metadata elements themselves (so-called meta-metadata). Examples of subclass titles in this class are:

- Globally unique identifiers
- ISO identifiers
- Object identifiers
- Device identifiers
- Unique IPR identifiers
- Local locators
- Titles

3.2.2 Class 2: Administration

Metadata in this class shall consist of administrative or business data that describe information about the essence or metadata that are relevant to its application. Information on authorized use and restrictions on use, and encryption are in this metadata class. Cost information and information needed to protect intellectual property or to protect ownership shall also be contained in class 2. Examples of subclass titles in this class are:

- Supplier
- Rights
- Financial information
- Security
- Publication outlet
- Participating parties
- Broadcast and repeat statistics

3.2.3 Class 3: Interpretive

Metadata in this class shall consist of descriptive information which is normally considered either a subjective or a human-generated description of the essence or a computational result from machine examination of the essence. Interpretive information shall consist of, but not be limited to, textual terms (e.g., keywords, narrative summary, titles, genre categories, scripts, etc.), or computational metrics (e.g., color histograms, texture maps, object shapes, facial features, etc.). Information in class 3 shall be principally used

for indexing, cataloging, administering, searching, and retrieving the content of essence. Examples of subclass titles in this class are:

- Fundamental (such as ISO language code, length and time systems)
- Descriptive (human-assigned)
- Categorization
- Assessments
- Descriptors (machine-assigned or computed)

3.2.4 Class 4: Parametric

Metadata in this class shall consist of information that describes the technical characteristics of the camera, sensor, or system that originates the essence or metadata. Information about the technical characteristics of the essence or metadata is also provided, including but not limited to its creation parameters and the configuration of the originating system. Examples of subclass titles in this class are:

- Video essence encoding characteristics
- Audio essence encoding characteristics
- Data essence encoding characteristics
- Metadata encoding characteristics
- Audio test parameters
- Film pulldown characteristics
- Fundamental sequencing and scanning
- MPEG coding characteristics
- Time code characteristics

3.2.5 Class 5: Process

Metadata in this class shall consist of information that describes how the essence was processed or otherwise changed or enhanced after its origination. This class shall include, but not be limited to, many of the parameters in an edit decision list. Additional information in class 5 shall be an audit trail (heritage) of all changes to the original content over time. Also included shall be a record of compression/decompression steps and any changes in storage media or format. Examples of subclass titles in this class are:

- Process indicators
- Manipulation
- Downstream processing history
- Enhancement or modification
- Audio processor settings (device-specific)
- Editing information

3.2.6 Class 6: Relational

Metadata in this class shall consist of information that describes relationships among objects in the content or among any combination of essence, objects, and metadata. Examples of subclass titles in this class are:

- Generic relationships
- Relatives
- Essence-to-essence relationship
- Metadata-to-essence relationship
- Metadata-to-metadata relationship
- Object-to-object relationship
- Metadata-to-object relationship
- Related production material
- Numerical sequence
- Relationship structures

3.2.7 Class 7: Spatio-temporal

Metadata in this class shall consist of information about aspects of the content or the originating camera, sensor, or system relating to time, place, or space. Geospatial information in class 7 shall be any information that defines the positions or places (either absolute or relative) of objects, scenes, individuals, or any other component of the essence. Temporal elements such as dates, time codes, synchronization marks, temporal keywords, and motion (vector) parameters shall also be part of class 7 metadata. Examples of subclass titles in this class are:

- Position and space vectors
- Absolute position
- Image positional information
- Rate and direction of positional change
- Abstract locations
- Angular specifications
- Distance measurements
- Operational date and time information
- Absolute date and time
- Relative durations
- Rights date and time
- Setting date and time (characterized time period)
- Delay
- Latency

3.2.8 Class 13: Organizationally registered for public use

Metadata in this class shall consist of individual elements of metadata that have been registered by a specific user organization or individual and are therefore reserved and managed separately from the other

classes (1 -7) of metadata. Information about publicly registered metadata shall appear in the appropriate clauses of the published metadata dictionary. Class 13 metadata shall be managed by the SMPTE Registration Authority and its approval shall be consistent with SMPTE Administrative Practices.

3.2.9 Class 14: Organizationally registered as private

Metadata in this class shall consist of individual elements or groups of elements of metadata that have been registered by a specific user organization or individual and are therefore reserved and managed separately from the other classes (1 -7) of metadata. Information about organizationally registered metadata shall not be made public but the metadata tags shall be publicly identified in the metadata dictionary and shall be reserved for use by the registered organization. Class 14 metadata shall be managed by the SMPTE Registration Authority and its approval shall be consistent with SMPTE Administrative Practices.

3.2.10 Class 15: Experimental

Metadata in this class shall consist of information whose definition and use does not need to conform to the definitions in the metadata dictionary. Class 15 metadata is intended for use in multimedia research or other limited access, experimental environments where experimentation with new metadata elements and applications does not depend on strict conformance to approved standards and which remain within a test or laboratory environment.

3.3 Dictionary element structure and format

The metadata dictionary shall consist of the following fields for each metadata element:

3.3.1 Data element tag

This has eight fields representing the eight octets or bytes of the data element tag. These uniquely identify the specific metadata element in the dictionary in an hierarchical fashion. Classes are designated with the first byte in the data element tag and subsequent bytes enable the hierarchical identification of subclasses and/or individual leaves.

3.3.2 Data element name

This entry is the English language name for the element represented numerically by the data element tag.

3.3.3 Dictionary version at introduction

This entry records the version number of the dictionary standard (i.e., the structure standard/recommended practice pair) which first recorded the allocation of a data element against a data element tag.

3.3.4 Data element definition

This entry is the detailed and unambiguous English language definition of what is represented by the data element tag and element name.

3.3.5 Type

This entry identifies the representation category of metadata value allowed for this element in order to permit correct interpretation of that value; for example, in the case of a text string or an SMPTE time code. A compound type entry is a class or subclass node or split in the metadata dictionary hierarchy and cannot have a value associated with it. A document is under development which defines the types for each element in more detail.

3.3.6 Value length

This entry defines the permitted length in bytes or characters of the value of the data element. In some cases, such as a text string, the length is not defined or limited and the value length is described as variable. However, in practice, a variable length may be limited by the application specification.

3.3.7 Value range

This entry defines any limitations on the permitted values of a data element.

3.3.8 Node/leaf

This entry defines whether the dictionary entry is a node in the classification structure or a leaf as defined in 3.1.

3.3.9 Defining document

In cases where the data element type or other parameter is defined in another document, this entry

references that standard or the authoritative source of the information.

3.4 Metadata dictionary structure maintenance

The principles for maintenance and administration of the metadata dictionary structure are defined in the following clauses:

3.4.1 Dictionary version information

The following information shall be provided by the SMPTE Registration Authority with each update to the metadata dictionary structure and contents:

Standard name: Metadata dictionary structure standard

Standard designator: One-byte unsigned integer in the range of 1 to 127

Version number: One-byte unsigned integer in the range of 1 to 127

Effective date: TBD

Database format: Text

Summary of changes: Text

Database administrator: Text with URL or e-mail

Contact information: Text with URL or e-mail

3.4.2 Dictionary management and compatibility requirements

To ensure reliable and correct interpretation of legacy material in the future, changes to SMPTE RP 210 shall be additions only. Deletions or changes to entries (other than purely editorial) are not permitted. This addition process shall be speedily carried out and documented in accordance with SMPTE 359M by the SMPTE Registration Authority. It shall occur immediately on request from the appropriate SMPTE technology committee and shall be administered and scrutinized with a light but formal touch to ensure minimal delay in the availability for use of a newly required registered tag. The version number of the dictionary shall be incremented each and every time an addition (or group of additions) is made since this is critical to ensuring the operational compatibility of metadata decoders. The incrementing of the version number shall not prevent use of unaffected tags,

structure, or contents by a decoder that conforms to the prior version.

It is inevitable, given the above addition process, that eventually the dictionary will become cluttered with legacy entries to the point where the responsible SMPTE technology committee determines it has reached the limit of its usefulness. At this stage, or when other changes to the dictionary contents, to an existing approved dictionary structure, or to relationships among metadata classes that prevent backward compatibility are necessary, a new dictionary consisting of both structure standard and contents recommended practice shall be created and the structure and contents of the new dictionary made readily accessible on-line by the SMPTE Registration Authority to

Annex A (normative) Glossary of terms

A.1 content: The program content will consist of the sum total of the essence (video, audio, data, etc.) and the metadata.

A.2 data element: An individual unit of data or metadata.

A.3 data element definition: The detailed and unambiguous definition of what is represented by the key and element name.

A.4 data element name: The English language name for the element represented numerically by the data element tag.

A.5 data element tag: The 8-byte tag that uniquely identifies the data element in the metadata dictionary.

A.6 essence: Identified by the SMPTE/EBU Task Force for Harmonized Standards for the Exchange of Program Material as Bitstreams (TFHS) as the digital representation of video, audio, and/or data information. Essence can therefore also be graphics, telemetry, photographs, or other information.

A.7 label: A 16-byte key that explicitly identifies a pre-defined value or group of values.

A.8 metadata: Generally referred to as data about data or data describing other data. More specifically, information

allow upgrades to decoders. The superseded standard shall then undergo no further revision unless essential under the SMPTE five-year rule.

3.4.3 Dictionary availability

The dictionary documents shall be available in electronic form in a defined electronic publishing format, such as XML with an accompanying document type definition.

The latest version of SMPTE RP 210 shall be made available on the SMPTE website in a noneditable format (pdf or equivalent). It is preferred that a minimum of the two immediate previous versions be also available in a clearly indicated archive.

that is considered ancillary to or otherwise directly complementary to the essence. Any information that a content provider considers useful or of value when associated with the essence being provided.

A.9 metadata class: The broad category of metadata that forms the first level of hierarchy for all registered metadata.

A.10 metadata dictionary: The standard database of approved, registered data element tags and their definitions.

A.11 metadata element: A broad term for a unit of metadata.

A.12 metadata tag: The 8-byte tag that uniquely identifies the data element in the metadata dictionary.

A.13 type: Information about the representation of the metadata or data value. A document is under development which defines the type for each element in more detail.

A.14 value: The instance of information described by the metadata tag. Equivalent to description in the terminology of MPEG-7.

Annex B (informative) Organization of references

The organization of standards and guidelines for metadata are illustrated in figure B.1. No single standard can contain all of the information needed to describe and encode metadata. Hence, a layered approach is used to convey the information so the user can select the applicable standard(s) for the level of implementation needed. This standard, the metadata dictionary recommended practice (SMPTE RP 210),

the standard for key-length-value (KLV) data encoding (SMPTE 336M), and the standard for the registration process (SMPTE 359M) form the SMPTE normative standards for metadata. Informative SMPTE documents supplement the standards for encoding with examples and administrative instructions on managing the data standardization and registration process via the SMPTE Registration Authority.

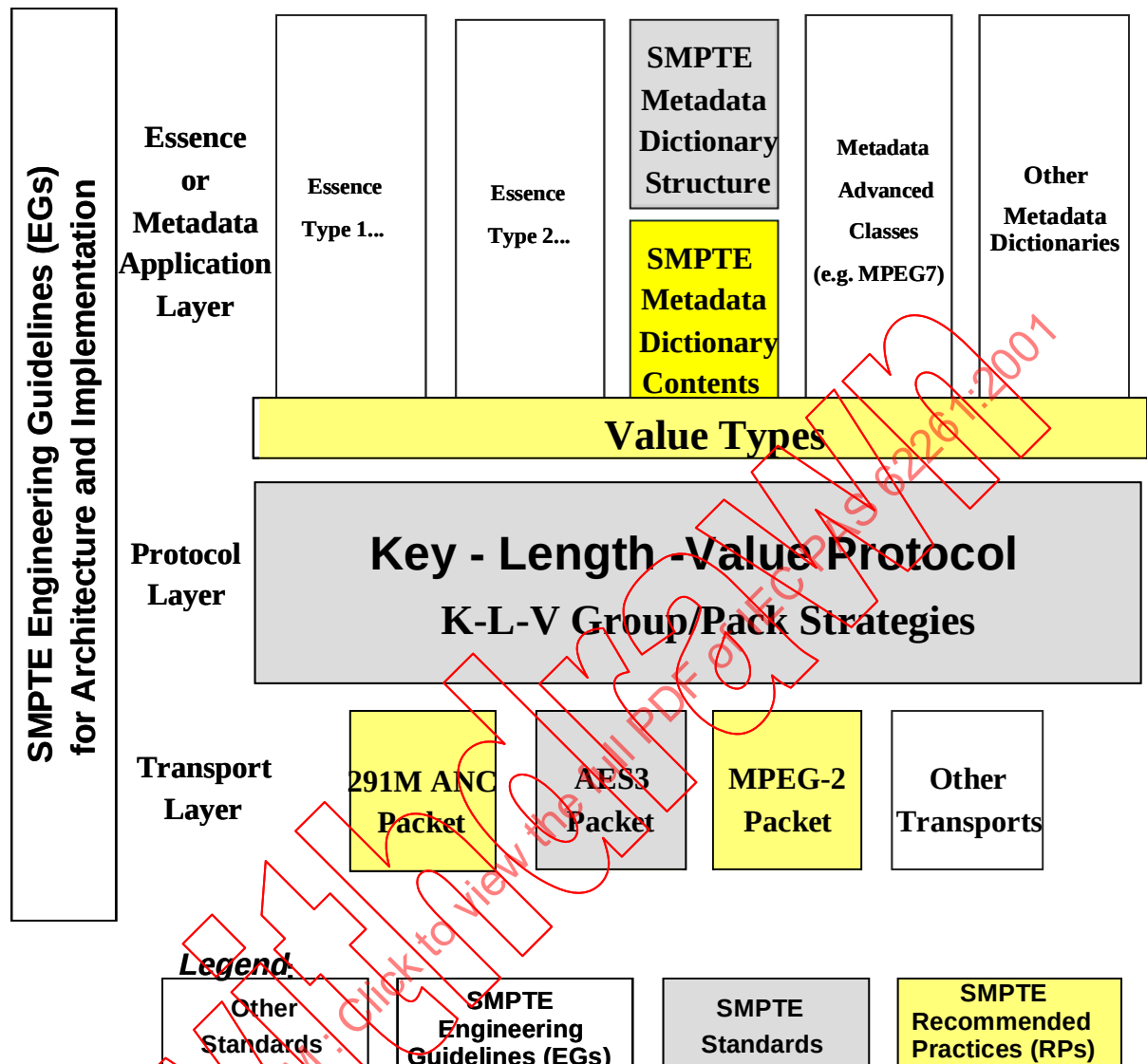


Figure B.1 – Organization of references

Annex C (informative) Bibliography

SMPTE 330M-2000, Television — Unique Material Identifier (UMID)

SMPTE 355M-2001, Television — Format for Non-PCM Audio and Data in AES3 — KLV Data Type

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

SMPTE RP XXX, Nonsynchronized Mapping of KLV Packets into MPEG-2 Systems Streams

SMPTE EG 37, Node Structure for the SMPTE Metadata Dictionary

RP 210A-2000

SMPTE RECOMMENDED PRACTICE

Metadata Dictionary Registry of Metadata Element Descriptions

1 Scope

This Metadata Dictionary Contents Recommended Practice defines a Registry of Metadata Element Descriptions for association with essence or other Metadata. A full explanation is contained in SMPTE Standard SMPTE 335M Metadata Dictionary Structure.

The Metadata Dictionary Structure defined in SMPTE 335M covers the use of Metadata for all types of essence (video, audio and data in their various forms). The Standard specifies that any Application must conform both to

- (a) the definitions and formats in SMPTE 335M and
- (b) to this Metadata Dictionary Contents Recommended Practice.

i.e. the Standard and this Recommended Practice must be used together as a pair – neither must be used in isolation.

This document contains a representation of the SMPTE Metadata Dictionary Registry contents in the form of an Excel spreadsheet and other representations will be made available as specified in SMPTE335M.

2 References

2.1 Normative References

SMPTE 298M	Universal Labels for Unique Identification of Digital Data
SMPTE 335M	Metadata Dictionary Structure
SMPTE 359M	Dynamic Documents
SMPTE XXX	Types Dictionary Structure
SMPTE XXX	Metadata Values Registry Structure

All other normative references are contained in the Registry itself as part of each metadata element description.

2.2 Informative References

SMPTE EG-37	Node Structure for the Metadata Dictionary
SMPTE 336M	Data Encoding Protocol Using Key-Length-Value (KLV)

3 Registry Structure

The following is intended as an informative note only. A full explanation is contained in SMPTE Standard "Metadata Dictionary Structure" SMPTE 335M.

For convenience of the management of the Registry, metadata elements are listed under the six distinct classes of Identification; Administration; Interpretation; Parametric; Process; Relational and Spacio-Temporal. Two further classes are reserved for Organizationally Registered Metadata and one for Experimental use.

These classes are further broken down under Nodes, which are again for management purposes only.

Each Metadata element is listed by Name, with a Definition of what it is, its data type, length, reference to existing standards where appropriate and a unique 8 byte Key. Although Nodes have a key allocated, this is not used - it is once again an aid for management purposes only.

SMPTE Metadata Dictionary (RP210A) - Trial Publication July 2000**Please read in conjunction with the cover sheet of this workbook**

Dictionary Version at Introduction	Node or Leaf	SMPTE label (last 8 octets following Metadata Dictionary Universal Label)								Data Element Name	Data Element Definition	Type	Value Length	Value Range	Defining Document	Notes
	Node	01	00	00	00	00	00	00	00	IDENTIFIERS & LOCATORS	Class 1 metadata is reserved for abstract identifiers & locators					
	Node	01	01	00	00	00	00	00	00	Globally Unique Identifiers	Unique identifiers and locators					
1	Leaf	01	01	01	XY	00	00	00	00	UMID Video	Unique Material Identifier for video essence. Note - the UMID has a 12 byte SMPTE label. XY defines the Material/Instance number creation and/or usage methods.	As per SMPTE standard	32		SMPTE 330M	
1	Leaf	01	01	02	XY	00	00	00	00	UMID Audio	Unique Material Identifier for audio essence. Note - the UMID has a 12 byte SMPTE label. XY defines the Material/Instance number creation and/or usage methods.	As per SMPTE standard	32		SMPTE 330M	
1	Leaf	01	01	03	XY	00	00	00	00	UMID Data	Unique Material Identifier for data essence. Note - the UMID has a 12 byte SMPTE label. XY defines the Material/Instance number creation and/or usage methods.	As per SMPTE standard	32		SMPTE 330M	
1	Leaf	01	01	04	XY	00	00	00	00	UMID System	Unique Material Identifier for other material including grouped picture, audio or data essence. Note - the UMID has a 12 byte SMPTE label. XY defines the Material/Instance number creation and/or usage methods.	As per SMPTE standard	32		SMPTE 330M	
	Node	01	01	10	00	00	00	00	00	International broadcasting organisation identifiers	Internationally recognised identifiers registered by broadcasting organisations					
1	Leaf	01	01	10	01	00	00	00	00	Organisation Identifiers	The broadcasting organisation concerned.	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	127 bytes max			
	Node	01	01	10	03	00	00	00	00	Programme Identifiers	Unique programme identifiers					
1	Leaf	01	01	10	03	01	00	00	00	UPID	A Unique Program Identifier (ATSC A/57) for a programme as a Work	As per ATSC standard			As per ATSC standard	
1	Leaf	01	01	10	03	02	00	00	00	UPN	Unique Programme Number (ITVA)	As per ITVA standard			As per ITVA standard	
	Node	01	01	10	04	00	00	00	00	Physical Media identifiers	Physical media identifiers					
	Node	01	01	10	04	01	00	00	00	Tape Identifiers	Tape identifiers					
1	Leaf	01	01	10	04	01	01	00	00	IBTN	EBU International Broadcast Tape Number	As per EBU standard				
	Node	01	01	11	00	00	00	00	00	ISO Identifiers	International Standards Organisation Identifier Schemes					
1	Leaf	01	01	11	01	00	00	00	00	ISAN	ISO Audio-Visual Number	As per ISO standard			TBA	
1	Leaf	01	01	11	02	00	00	00	00	ISBN	ISO Book Number	As per ISO standard			TBA	
1	Leaf	01	01	11	03	00	00	00	00	ISSN	ISO Serial Number	As per ISO standard			TBA	
1	Leaf	01	01	11	04	00	00	00	00	ISWC	ISO Musical Work Code	As per ISO standard			TBA	
1	Leaf	01	01	11	05	00	00	00	00	ISMN	ISO Printed Music Number	As per ISO standard			TBA	
1	Leaf	01	01	11	06	00	00	00	00	ISCI	ISO Commercial Identifier	As per ISO standard			TBA	
1	Leaf	01	01	11	07	00	00	00	00	ISRC	ISO Recording Code	As per ISO standard			TBA	
1	Leaf	01	01	11	08	00	00	00	00	ISRN	ISO Report Number	As per ISO standard			TBA	
1	Leaf	01	01	11	09	00	00	00	00	ISBD	ISO Bibliographic Descriptor	As per ISO standard			TBA	
1	Leaf	01	01	11	0A	00	00	00	00	ISTC	ISO Textual Work Code	As per ISO standard			TBA	
	Node	01	01	13	00	00	00	00	00	ISO-based Compound IDs	Compound ISO-based Identifiers					
1	Leaf	01	01	13	01	00	00	00	00	SICI	Serial Item and Contribution Identifier	As per ISO standard			TBA	

Dictionary Version at introduction	Node or Leaf	SMPTE label (last 8 octets following Metadata Dictionary Universal Label)								Data Element Name	Data Element Definition	Type	Value Length	Value Range	Defining Document	Notes
1	Leaf	01	01	13	02	00	00	00	00	BICI	Book Item and Component Identifier	As per ISO standard			TBA	
1	Leaf	01	01	13	03	00	00	00	00	AICI	Audio-Visual Item and Component Identifier <i>[proposed]</i>	As per ISO standard			TBA	
1	Leaf	01	01	13	04	00	00	00	00	PII	Publisher Item Identifier	As per ISO standard			TBA	
	Node	01	01	15	00	00	00	00	00	Object identifiers	Object identifiers					
1	Leaf	01	01	15	01	00	00	00	00	DOI	Digital Object Identifier	As per DOI standard			TBA	
1	Leaf	01	01	15	02	00	00	00	00	GUID	The ISO/IEC 11578 (Annex A) 16 byte Globally Unique Identifier	As per ISO 11578 standard (Annex A)			ISO 11578 (Annex A)	
1	Leaf	01	01	15	10	00	00	00	00	Package ID	Identifies the Metadata Object with a SMPTE label or GUID	PackageID	32 bytes		W25.52	
	Node	01	01	20	00	00	00	00	00	Device Identifiers	Unique identifiers for any device used in programme production - cameras, microphones, editing, colour grading, etc.					
1	Leaf	01	01	20	01	00	00	00	00	Device Designation	Identifies the "house name" of the device used in capturing or generating the essence.	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 chars max			
1	Leaf	01	01	20	03	00	00	00	00	Device Model	Identifies the device model used in capturing or generating the essence.	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 chars max			
1	Leaf	01	01	20	04	00	00	00	00	Device Serial Number	Alphanumeric serial number identifying the individual device	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 chars max			
	Node	01	02	00	00	00	00	00	00	Globally Unique Locators	Globally Unique path definitions					
	Node	01	02	01	00	00	00	00	00	UR locators	Unique Resource Locators					
1	Leaf	01	02	01	01	00	00	00	00	URL String (ISO 7 bit)	Unique Resource Locator String	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	255 bytes max			
1	Leaf	01	02	01	01	01	00	00	00	URL String (Unicode)	Unique Resource Locator String	16 bit Unicode String	variable 255 chars max.		W25.52	
1	Leaf	01	02	01	02	00	00	00	00	PURL	Persistent Universal Resource Locator	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	255 bytes max			
1	Leaf	01	02	01	03	00	00	00	00	URN	Unique Resource Name	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	256 bytes max			
	Node	01	03	00	00	00	00	00	00	Locally Unique Identifiers	Identifier unique to the local context					
	Node	01	03	01	00	00	00	00	00	Administrative identifiers	Identifiers relating to Business and Administration					
1	Leaf	01	03	01	01	00	00	00	00	Transmission Identifier	Identifier for transmission control	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 chars max			
1	Leaf	01	03	01	02	00	00	00	00	Archive Identifier	Identifier for archival purposes	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 chars max			
1	Leaf	01	03	01	03	00	00	00	00	Item ID	Identifier of a content item	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 chars max			
1	Leaf	01	03	01	04	00	00	00	00	Accounting Reference	Reference number for accounting purposes	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 chars max			
1	Leaf	01	03	01	05	00	00	00	00	Traffic ID	Identifier for emission management and/or billing	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 chars max			
	Node	01	03	02	00	00	00	00	00	Physical Media identifiers	Organisationally given identifiers for physical media					
	Node	01	03	02	01	00	00	00	00	Film codes	Organisationally given identifiers for film					
1	Leaf	01	03	02	01	01	00	00	00	Reel/Roll number	An organisationally given number for a film reel or roll.	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 chars max			
	Node	01	03	02	02	00	00	00	00	Tape identifiers	Organisationally given identifiers for tape					
1	Leaf	01	03	02	02	01	00	00	00	Tape number	An organisationally given number for a tape.	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 chars max			
	Node	01	03	03	00	00	00	00	00	Object identifiers	Object identifiers					
1	Leaf	01	03	03	01	00	00	00	00	LUID	A 4 byte locally unique ID	UInt32	4 bytes			

Dictionary Version at introduction	Node or Leaf	SMPTE label (last 8 octets following Metadata Dictionary Universal Label)								Data Element Name	Data Element Definition	Type	Value Length	Value Range	Defining Document	Notes
1	Leaf	01	03	03	02	01	00	00	00	Package Name	Identifies the AAF metadata object by name	16 bit Unicode String	variable		W25.52	
	Node	01	04	00	00	00	00	00	00	Locally Unique Locators	Locally unique path definitions					
	Node	01	04	01	00	00	00	00	00	Media Locators	Local paths for a digital media, data, metadata file etc					
1	Leaf	01	04	01	01	00	00	00	00	Local File Path	The local path to a complete digital media, data, metadata etc file	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	255 bytes max			
	Node	01	04	07	00	00	00	00	00	Film Locators	Location information for film					
1	Leaf	01	04	07	01	00	00	00	00	Edge Code	The edge code on the film eg feet, frames	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 chars max			
1	Leaf	01	04	07	02	00	00	00	00	Frame Code	Unique frame number for film	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 chars max			
1	Leaf	01	04	07	03	00	00	00	00	Key code	Machine readable version of Frame Code	UInt32	4 bytes			
1	Leaf	01	04	07	04	00	00	00	00	Link number	Link number	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 chars max			
	Node	01	04	10	00	00	00	00	00	Proxy locators	Local archival location information for key frames, keys sounds, key text etc					
1	Leaf	01	04	10	01	00	00	00	00	Key text	Local archival location information for key text	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	127 bytes max			
1	Leaf	01	04	10	02	00	00	00	00	Key Frame	Local archival location information for key frames	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	127 bytes max			
1	Leaf	01	04	10	03	00	00	00	00	Key Sound	Local archival location information for keys sounds	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	127 bytes max			
1	Leaf	01	04	10	04	00	00	00	00	Key data or program	Local archival location information for key data or program	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	127 bytes max			
	Node	01	05	00	00	00	00	00	00	Titles	Titling metadata relating to productions					
1	Leaf	01	05	01	00	00	00	00	00	Title kind	Kind of title, i.e., project, series, item, programme, working, original, item, episode, element, scene, shot etc	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	127 bytes max			
1	Leaf	01	05	02	00	00	00	00	00	Main title	The main title	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	127 bytes max			
1	Leaf	01	05	03	00	00	00	00	00	Secondary title	The secondary title	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	127 bytes max			
1	Leaf	01	05	04	00	00	00	00	00	Series number	The alphanumeric series number	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 chars max			
1	Leaf	01	05	05	00	00	00	00	00	Episode Number	The alphanumeric episode number	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 chars max			
1	Leaf	01	05	06	00	00	00	00	00	Scene number	The alphanumeric scene number	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 chars max			
1	Leaf	01	05	07	00	00	00	00	00	Take Number	Take number of the instance of the shot	UInt16	2 bytes			
	Node	01	10	00	00	00	00	00	00	Unique IPR Identifiers	Unique IDs allocated by IP Rights organisations					
	Node	01	10	01	00	00	00	00	00	IPI (SUISA/CISAC)	IP Identifiers allocated by CISAC					
1	Leaf	01	10	01	01	00	00	00	00	Natural Person / legal entity	Natural person or legal entity ID in the Interested Parties system	As per CISAC standard			TBA	
	Node	01	10	02	00	00	00	00	00	AGICOA/MPAA	Unique Identifiers allocated by AGICOA					
1	Leaf	01	10	02	01	00	00	00	00	AGICOA/MPAA Identifier	The AGICOA ID.	As per AGICOA standard			TBA	
	Node	02	00	00	00	00	00	00	00	ADMINISTRATION	Class 2 is reserved for administrative and business related metadata					

Dictionary Version at introduction	Node or Leaf	SMPTE label (last 8 octets following Metadata Dictionary Universal Label)								Data Element Name	Data Element Definition	Type	Value Length	Value Range	Defining Document	Notes
	Node	02	01	00	00	00	00	00	00	Supplier	Details of the content supplying organisation					
1	Leaf	02	01	01	00	00	00	00	00	Source Organization	The name of the content supplying organisation	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	127 bytes max			
1	Leaf	02	01	02	00	00	00	00	00	Supply contract number	The alphanumeric number for the contract for the supply of content	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 chars max			
1	Leaf	02	01	03	00	00	00	00	00	Original Producer Name	The name of the original content Producer.	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	127 bytes max			
	Node	02	02	00	00	00	00	00	00	Product	Abstract information about the media product					
1	Leaf	02	02	01	00	00	00	00	00	Total number of Episodes in a Series	Total number of Episodes in Series	UInt16	2 bytes			
	Node	02	05	00	00	00	00	00	00	Rights	Rights metadata					
	Node	02	05	01	00	00	00	00	00	Copyright	Copyright metadata					
1	Leaf	02	05	01	01	00	00	00	00	Copyright Status	Executive evaluation of copyright status	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	127 bytes max			
1	Leaf	02	05	01	02	00	00	00	00	Copyright Owner	The name of the person/organisation who owns the copyright.	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	127 bytes max			
	Node	02	05	02	00	00	00	00	00	Intellectual rights	Intellectual property rights metadata other than copyright					
1	Leaf	02	05	02	01	00	00	00	00	IP Type	A definition of the IP in freeform text	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
1	Leaf	02	05	02	02	00	00	00	00	IP Right	A freeform text definition of what use can be made of an IP	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
	Node	02	05	03	00	00	00	00	00	Legal personalities	A person or body in whom legal responsibility can be vested					
1	Leaf	02	05	03	01	00	00	00	00	Rights Owner	A definition of who or what entity can exercise an IP right	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	127 bytes max			
1	Leaf	02	05	03	02	00	00	00	00	Rights Management Authority	Entity that manages the rights for access to the material	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	127 bytes max			
1	Leaf	02	05	03	03	00	00	00	00	Interested parties	A definition of who or what entity has an interest in the right being exercised	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	127 bytes max			
	Node	02	05	04	00	00	00	00	00	IP Right options	A definition of what options can be exercised within the framework of using an IP Right					
1	Leaf	02	05	04	01	00	00	00	00	Maximum Number Of Usages	Maximum number of usages or repeats	UInt16	2 bytes			
1	Leaf	02	05	04	02	00	00	00	00	License options	Options for prolongation or renewal of license	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	127 bytes max			
	Node	02	06	00	00	00	00	00	00	Financial information	Details of payments, costs, income money and other considerations					
	Node	02	06	01	00	00	00	00	00	Currencies	Information about currencies involved in transactions					
1	Leaf	02	06	01	01	00	00	00	00	Currency	The currency of the transaction	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	4 chars max		TBA	
	Node	02	06	02	00	00	00	00	00	Payments and costing	Payments and costing information					
1	Leaf	02	06	02	01	00	00	00	00	Royalty Financial Information	Royalty payment and other information	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	127 bytes max			
	Node	02	06	03	00	00	00	00	00	Income	Income information					
1	Leaf	02	06	03	01	00	00	00	00	Royalty Financial Information	Royalty income and other information	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	127 bytes max			
	Node	02	07	00	00	00	00	00	00	Permitted Access	Details of permitted access to the media product					
1	Leaf	02	07	01	00	00	00	00	00	Restrictions on Use	Identifies the type or level of restriction applied to the media product.	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			

Dictionary Version at introduction	Node or Leaf	SMPTE label (last 8 octets following Metadata Dictionary Universal Label)								Data Element Name	Data Element Definition	Type	Value Length	Value Range	Defining Document	Notes
	Node	02	08	00	00	00	00	00	00	Security	Content encryption/decryption information					
	Node	02	08	01	00	00	00	00	00	System Access	Details of permitted access to the technical system or platform					
1	Leaf	02	08	01	01	00	00	00	00	Username (ISO 7-bit)	A username in a domain	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	16 chars max			
1	Leaf	02	08	01	01	01	00	00	00	Username (Unicode)	A username in a domain	16 bit Unicode String	16 chars max			
1	Leaf	02	08	01	02	00	00	00	00	Password (ISO 7-bit)	An individual password for access to the system	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	16 chars max			
1	Leaf	02	08	01	02	01	00	00	00	Password (Unicode)	An individual password for access to the system	16 bit Unicode String	16 chars max			
	Node	02	09	00	00	00	00	00	00	Encryption	Content encryption/decryption information					
	Node	02	09	01	00	00	00	00	00	Film Encryption	Content encryption/decryption information for Film					
	Node	02	09	01	01	00	00	00	00	Scrambling Keys	Information about decryption keys for Film					
1	Leaf	02	09	01	01	01	00	00	00	Scrambling key kind	The programme decryption key type for Film	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	4 chars max		TBA	
1	Leaf	02	09	01	01	02	00	00	00	Scrambling key value	The programme decryption key value for Film	UInt 8	64 bytes max			
	Node	02	10	00	00	00	00	00	00	Publication Outlet	The content publication outlet - eg Broadcast, internet etc					
	Node	02	10	01	00	00	00	00	00	Broadcast	Broadcast Outlet information					
	Node	02	10	01	01	00	00	00	00	Broadcaster	The broadcasting organisation					
1	Leaf	02	10	01	01	01	00	00	00	Name	Name of the broadcasting organisation	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
1	Leaf	02	10	01	01	02	00	00	00	Channel	Broadcast channel	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
1	Leaf	02	10	01	01	03	00	00	00	Publishing Medium	Publishing medium, including transmission (e.g., satellite, cable, terrestrial, ...)	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
1	Leaf	02	10	01	01	04	00	00	00	Broadcast Region	Target region of broadcast	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
	Node	02	20	00	00	00	00	00	00	Broadcast and Repeat Information	Business information concerning the production					
	Node	02	20	01	00	00	00	00	00	Broadcast Flags	Flags concerning aspects of business or administration					
1	Leaf	02	20	01	01	00	00	00	00	First Broadcast Flag	First broadcast of the product	Boolean	1 byte	00h (FALSE) or FFh (TRUE)		
	Node	02	20	02	00	00	00	00	00	Repeat numbers	Information about the repeat status when not a first broadcast					
1	Leaf	02	20	02	01	00	00	00	00	Current repeat number	The number of the current repeat	UInt16	2 bytes			
1	Leaf	02	20	02	02	00	00	00	00	Previous repeat number	The number of the previous repeat	UInt16	2 bytes			
	Node	02	20	03	00	00	00	00	00	Ratings	Information about audience ratings and indices					
1	Leaf	02	20	03	01	00	00	00	00	Audience rating	Audience rating as number of viewers	UInt32	4 bytes			
1	Leaf	02	20	03	02	00	00	00	00	Audience reach	The audience reach of the production	UInt32	4 bytes			
	Node	02	30	00	00	00	00	00	00	Participating parties	Details of all parties, contributing to or taking part in the production - staff, contributors, and including those receiving Credits etc					
	Node	02	30	01	00	00	00	00	00	Persons (Groups and Individuals and Groups)	Details of persons or groups of people contributing to or taking part in the production					

Dictionary Version at introduction	Node or Leaf	SMPTE label (last 8 octets following Metadata Dictionary Universal Label)								Data Element Name	Data Element Definition	Type	Value Length	Value Range	Defining Document	Notes
1	Leaf	02	30	01	01	00	00	00	00	Nature of Personality (Individual or Group)	Group, Individual etc	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
	Node	02	30	01	02	00	00	00	00	Production	Details of Performing talent, Non performing talent, Production Staff, Technical staff, Specialist etc					
1	Leaf	02	30	01	02	01	00	00	00	Contribution Status	Performing talent, Non performing talent, Production Staff, Technical staff, Specialist etc	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
	Node	02	30	01	03	00	00	00	00	Support and Administration	Details of support and administrative staff or contributors - business management, resource planning, archiving etc					
1	Leaf	02	30	01	03	01	00	00	00	Support/Administration Status	Cataloguing staff, finance staff etc	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
	Node	02	30	02	00	00	00	00	00	Organisations and Public Bodies	Details of Organisations and Public Bodies contributing to or taking part in the production					
1	Leaf	02	30	02	01	00	00	00	00	Nature of Organisation or Public Body	Limited company, government department etc.	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
	Node	02	30	02	02	00	00	00	00	Production	Details of Performing contribution, Non performing contribution, Production contribution, Technical contribution, Specialism etc					
1	Leaf	02	30	02	02	01	00	00	00	Contribution Status	eg. Film Library	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
	Node	02	30	02	03	00	00	00	00	Support and Administration	Details of support and administrative contribution - business management, resource planning, archiving etc					
1	Leaf	02	30	02	03	01	00	00	00	Support/Administration Status	eg. Banker	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
	Node	02	30	05	00	00	00	00	00	Job Function Information	Information about the job function or role of participating parties					
1	Leaf	02	30	05	01	00	00	00	00	Job Function	The function of the persons(s), organisation or public body eg. Editor, Actor	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
1	Leaf	02	30	05	02	00	00	00	00	Role/Identity	eg. Name of character played	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
	Node	02	30	06	00	00	00	00	00	Contact information	Contact information for the participating party					
1	Leaf	02	30	06	01	00	00	00	00	Contact kind	Client, supplier, useful etc	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
1	Leaf	02	30	06	02	00	00	00	00	Contact Department	Name information for a department within an organisation where contact can be made	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
	Node	02	30	06	03	00	00	00	00	Person or Organisation Details	The name of person(s), organisation or public body					
	Node	02	30	06	03	01	00	00	00	Person names	Name information for persons					
1	Leaf	02	30	06	03	01	01	00	00	Family name	The family name of an individual	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
1	Leaf	02	30	06	03	01	02	00	00	First Given name	The first given name for an individual	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
1	Leaf	02	30	06	03	01	03	00	00	Second Given name	The second given name for an individual	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
1	Leaf	02	30	06	03	01	04	00	00	Third Given name	The third given name for an individual	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
	Node	02	30	06	03	02	00	00	00	Group names	Name information for groups					
1	Leaf	02	30	06	03	02	01	00	00	Main name	The main name by which the group is known	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
1	Leaf	02	30	06	03	02	02	00	00	Supplementary name	Supplementary naming information for a group	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
	Node	02	30	06	03	03	00	00	00	Organisation names	Name information for organisations					
1	Leaf	02	30	06	03	03	01	00	00	Main name	The main name by which an organisation is known	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
1	Leaf	02	30	06	03	03	02	00	00	Supplementary organisational name	Supplementary naming information for an organisation	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
	Node	03	00	00	00	00	00	00	00	INTERPRETIVE	Class 3 is reserved for information on interpreting the data					

Dictionary Version at introduction	Node or Leaf	SMPTE label (last 8 octets following Metadata Dictionary Universal Label)								Data Element Name	Data Element Definition	Type	Value Length	Value Range	Defining Document	Notes
	Node	03	01	00	00	00	00	00	00	Fundamental	Fundamental defining information					
	Node	03	01	01	00	00	00	00	00	Countries and Languages	Defining information about Countries and languages					
	Node	03	01	01	01	00	00	00	00	Country and Region Codes	Country Codes and Region Codes					
1	Leaf	03	01	01	01	01	00	00	00	ISO 3166 Country Code System	ISO country codes	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	4 chars max		ISO 3166	
	Node	03	01	01	02	00	00	00	00	Language Codes	Language Codes					
1	Leaf	03	01	01	02	01	00	00	00	ISO Language Code	The short code that represents a language	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	4 chars max		TBA	
	Node	03	01	02	00	00	00	00	00	Data Interpretations	Defining information about data interpretation					
	Node	03	01	02	01	00	00	00	00	System interpretations	Interpretive information for common data systems					
1	Leaf	03	01	02	01	01	00	00	00	Operating system interpretations	1-byte code for distinction of common operating systems	UInt 8	1 byte	See types dictionary		
1	Leaf	03	01	02	01	02	00	00	00	Byte Order	Specifies the byte order of the metadata "MM"=Big endian, "II"=Little endian	Int16	2 bytes		W25.52	"MM"=Big endian, "II"=Little endian
1	Leaf	03	01	02	01	03	00	00	00	Essence Is Identified	Specifies whether the wrapper or container format identifies essence with an SMPTE label or other AUID (false=0)	Boolean	1 byte	00h (FALSE) or FFh (TRUE)	W25.52	
	Node	03	01	03	00	00	00	00	00	Fundamental Dimensions	Information about the four basic indefinables of natural philosophy					
	Node	03	01	03	01	00	00	00	00	Length	Descriptive information about length (Default is Metric system, metres)					
1	Leaf	03	01	03	01	01	00	00	00	Length System	Metric, Imperial etc	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	4 chars max	See Types dictionary		
1	Leaf	03	01	03	01	02	00	00	00	Length Units	Units of measurements of length and distance (feet, metres etc)	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	4 chars max	See Types dictionary		
	Node	03	01	03	02	00	00	00	00	Angles	Descriptive information about Angles (Default is Degrees)					
1	Leaf	03	01	03	02	01	00	00	00	Angular Unit	Degrees, Radians, Grads etc	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	4 chars max	See Types dictionary		
	Node	03	01	03	03	00	00	00	00	Time	Descriptive information about Time (Default is UTC system)					
1	Leaf	03	01	03	03	01	00	00	00	Time system offset	Time offset from UTC (Signed hours and minutes; colon delineated) (Default is "undefined").	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	6 chars max	+13hours/-12hours		
1	Leaf	03	01	03	03	02	00	00	00	Time Units	Frames, seconds, minutes etc. (Default is seconds).	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	4 chars max	See Types dictionary		
	Node	03	01	03	04	00	00	00	00	Mass	Descriptive information about Mass (Default is Metric system, Kilogramme)					
	Node	03	01	03	05	00	00	00	00	Energy	Descriptive information about Energy (Default is Joule)					
	Node	03	02	00	00	00	00	00	00	Descriptive - Human Assigned	Descriptors (Human Assigned) relating to analysis of the content					
	Node	03	02	01	00	00	00	00	00	Categorisation	Analytical categorisation of the content					
	Node	03	02	01	01	00	00	00	00	Content Classification	Content classification					
1	Leaf	03	02	01	01	01	00	00	00	Content Coding System	The system of coding for programme classification eg Escort 2.4	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	31 bytes max			
1	Leaf	03	02	01	01	02	00	00	00	Programme Type	Type of programme (e.g., cartoon, film, ...)	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
1	Leaf	03	02	01	01	03	00	00	00	Genre	Programme genre (e.g., entertainment, current affairs magazine, Italo Western, ...)	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
1	Leaf	03	02	01	01	04	00	00	00	Target Audience	Target audience (e.g., children, 17 to 32, elderly, ...)	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
	Node	03	02	01	02	00	00	00	00	Cataloguing and Indexing	Archival analysis of the essence metadata					
1	Leaf	03	02	01	02	01	00	00	00	Status of Catalogue Data	The current status of the catalogue as a freeform text string	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	127 bytes max			
1	Leaf	03	02	01	02	02	00	00	00	Cataloguing, Indexing, Thesaurus or Gazetteer system used	The particular Cataloguing, Indexing or Thesaurus system used	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
1	Leaf	03	02	01	02	03	00	00	00	Theme	The category of the Theme of the content	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			

Dictionary Version at introduction	Node or Leaf	SMPTE label (last 8 octets following Metadata Dictionary Universal Label)								Data Element Name	Data Element Definition	Type	Value Length	Value Range	Defining Document	Notes
1	Leaf	03	02	01	02	04	00	00	00	Subject Code	Subject Code.	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
1	Leaf	03	02	01	02	05	00	00	00	Key Words	Words or phrases summarizing an aspect of the data set.	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	127 bytes max			
1	Leaf	03	02	01	02	06	00	00	00	Key Frames	Freeform textual reference to a key frame of video in the data set	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	127 bytes max			
1	Leaf	03	02	01	02	07	00	00	00	Key Sounds	Freeform textual reference to a key sound in the data set	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	127 bytes max			
1	Leaf	03	02	01	02	08	00	00	00	Key data	Freeform textual reference to a key piece of data or program in the data set	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	127 bytes max			
	Node	03	02	01	06	00	00	00	00	Textual Description	A textual characterization of the data set.					
1	Leaf	03	02	01	06	01	00	00	00	Abstract	A brief narrative summary of the data set.	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	1024 bytes max			
1	Leaf	03	02	01	06	02	00	00	00	Purpose	A summary of the intentions with which the data set was developed.	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	127 bytes max			
1	Leaf	03	02	01	06	03	00	00	00	Description	A freeform textual description	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	variable			
1	Leaf	03	02	01	06	04	00	00	00	Colour descriptor	eg. Black and white, tinted etc	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
1	Leaf	03	02	01	06	05	00	00	00	Format descriptor	eg. Letterbox, Pillarbox etc	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
	Node	03	02	01	07	00	00	00	00	Stratum	The descriptive stratum of the archival content analysis of the content					
1	Leaf	03	02	01	07	01	00	00	00	Stratum kind	eg. Background, action, sound, natures etc	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
	Node	03	02	02	00	00	00	00	00	Assessments	Assessments of editorial, technical etc aspects of the content and contributors to it					
	Node	03	02	02	01	00	00	00	00	Awards	Awards relating to editorial, technical etc aspects of the content and contributors to it					
1	Leaf	03	02	02	01	01	00	00	00	Individual	Awards granted to individuals	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
1	Leaf	03	02	02	01	02	00	00	00	Programme	Awards granted to programme	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
	Node	03	02	02	02	00	00	00	00	Qualitative Values	Assessed values relating to editorial, technical etc aspects of the content and contributors to it					
1	Leaf	03	02	02	02	01	00	00	00	Asset Values	Assessment of the programme quality	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
1	Leaf	03	02	02	02	02	00	00	00	Content Value	Assessment of the content value	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
1	Leaf	03	02	02	02	03	00	00	00	Cultural Quality	Assessment of the cultural quality	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
1	Leaf	03	02	02	02	04	00	00	00	Asthetic Value	Assessment of the asthetic quality	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
1	Leaf	03	02	02	02	05	00	00	00	Historic Value	Assessment of the historic value	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
1	Leaf	03	02	02	02	06	00	00	00	Technical Value	Assessment of the technical value	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
1	Leaf	03	02	02	02	07	00	00	00	Other Values	Assessment of other relevant qualities	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
	Node	03	02	03	00	00	00	00	00	Technical comments/descriptions	Technical comments or descriptions relating to system					
	Node	03	02	03	01	00	00	00	00	Object comments/descriptions	Comments or descriptions relating to Objects					
	Node	03	03	00	00	00	00	00	00	Descriptors (Machine Assigned or Computed)	Descriptors (Machine Assigned or Computed) relating to analysis of the content					
	Node	03	03	01	00	00	00	00	00	Categorisation	Analytical categorisation of the content					
	Node	03	03	01	01	00	00	00	00	Content Classification	Content classification					
	Node	03	03	01	02	00	00	00	00	Cataloguing and Indexing	Archival analysis of the essence metadata					
1	Leaf	03	03	01	02	01	00	00	00	Status of Catalogue Data	The current status of the catalogue as a freeform text string	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	127 bytes max			

Dictionary Version at Introduction	Node or Leaf	SMPTE label (last 8 octets following Metadata Dictionary Universal Label)								Data Element Name	Data Element Definition	Type	Value Length	Value Range	Defining Document	Notes
1	Leaf	03	03	01	02	02	00	00	00	Cataloguing, Indexing or Thesaurus system used	The particular Cataloguing, Indexing or Thesaurus system used	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
1	Leaf	03	03	01	02	06	00	00	00	Key Words	Words or phrases summarizing an aspect of the data set.	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
1	Leaf	03	03	01	02	07	00	00	00	Key Frames	Freeform textual reference to a key frame of video in the data set	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
1	Leaf	03	03	01	02	08	00	00	00	Key Sounds	Freeform textual reference to a key sound in the data set	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
1	Leaf	03	03	01	02	09	00	00	00	Key data	Freeform textual reference to a key piece of data or program in the data set	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
	Node	03	03	01	06	00	00	00	00	Textual Description	A textual characterization of the data set.					
	Node	03	03	01	07	00	00	00	00	Stratum	The descriptive stratum of the archival content analysis of the content					
1	Leaf	03	03	01	07	01	00	00	00	Stratum kind	eg: Background, action, sound natures etc	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
	Node	03	03	03	00	00	00	00	00	Technical comments/descriptions	Technical comments or descriptions relating to system					
	Node	03	03	03	01	00	00	00	00	Object comments/descriptions	Comments or descriptions relating to Objects					
	Node	04	00	00	00	00	00	00	00	PARAMETRIC	Class 4 is reserved for parametric and configuration metadata.					
	Node	04	01	00	00	00	00	00	00	Video/Image Essence Characteristics	All parametric aspects of the video/image essence					
	Node	04	01	01	00	00	00	00	00	Fundamental Image Characteristics	Fundamental characteristics of the image					
	Node	04	01	01	01	00	00	00	00	Aspect Ratios	Specifies the horizontal to vertical aspect ratio of the image.					
1	Leaf	04	01	01	01	01	00	00	00	Presentation Aspect Ratio	Specifies the horizontal to vertical aspect ratio of the image as it is to be presented.	Rational	8 bytes		W25.52	
1	Leaf	04	01	01	01	02	00	00	00	Capture aspect ratio	Specifies the horizontal to vertical aspect ratio of the image captured at the sensor.	Unsigned Char	1 byte	See types dictionary		
	Node	04	01	02	00	00	00	00	00	Image Source Characteristics	Fundamental characteristics of the image source					
	Node	04	01	02	01	00	00	00	00	Opto-electronic formulation	Fundamental opto-electronic transfer etc characteristics					
	Node	04	01	02	01	01	00	00	00	Transfer Characteristics	Specifies the non-linear relationship between linear scene light levels and amplitude-compressed video signal levels.					
1	Leaf	04	01	02	01	01	01	00	00	Capture Gamma Equation (ISO 7-bit)	Specifies the non-linear relationship between linear scene light levels and amplitude-compressed video signal levels at signal origination.	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	4 chars max	See types dictionary		
1	Leaf	04	01	02	01	01	01	01	00	Capture Gamma Equation	Specifies the non-linear relationship between linear scene light levels and amplitude-compressed video signal levels at signal origination.	Rational	8 bytes	w25.52	not W25-52!	
1	Leaf	04	01	02	01	01	02	00	00	Luma Equation	Specifies the equation used to derive luma and chroma from gamma-corrected RGB signals	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	4 chars max	See types dictionary		
1	Leaf	04	01	02	01	01	03	00	00	Colorimetry Code	The fundamental color coding that relates the scene CIE tri-stimulus values (X, Y, Z) to the linear video levels (R, G, B).	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	4 chars max	See types dictionary		
1	Leaf	04	01	02	01	01	04	00	00	Signal Form Code	Code specifies the component sequence for the video pixel matrix (eg RGB, YUV etc).	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	4 chars max	See types dictionary		
	Node	04	01	03	00	00	00	00	00	Video/Image scanning parameters	Fundamental scanning and sequencing information					
	Node	04	01	03	01	00	00	00	00	Temporal parameters	Time dependant sequencing and scanning information					
1	Leaf	04	01	03	01	01	00	00	00	Color Field Code	Identifies the color field of the source video field for video derived from composite sources.	UInt8	1 byte	00h = undefined (default), 01h ~ 08h = field number		
1	Leaf	04	01	03	01	02	00	00	00	Field Rate	Specifies the field rate of the video scanning system.	UInt16	2 byte	See types dictionary		

Dictionary Version at Introduction	Node or Leaf	SMPTE label (last 8 octets following Metadata Dictionary Universal Label)								Data Element Name	Data Element Definition	Type	Value Length	Value Range	Defining Document	Notes
1	Leaf	04	01	03	01	03	00	00	00	Frame Rate	The rate that video images are captured, expressed in frames per second.	UInt16	2 byte	See types dictionary		
1	Leaf	04	01	03	01	04	00	00	00	Frame Layout	Specifies frame layout (interlaced, single frame, full frame, etc.)	LayoutType	2 bytes	See types dictionary	W25.52	
1	Leaf	04	01	03	01	05	00	00	00	Sampling Structure Code	A code that specifies the analogue or digital sampling structure for the video scanning system. Eg Progressive	Unsigned Char	1 byte	See types dictionary		
	Node	04	01	03	02	00	00	00	00	Vertical parameters	Vertical scanning information					
1	Leaf	04	01	03	02	01	00	00	00	Total Lines per Frame	Specifies the number of lines in a total frame in the video scanning system.	UInt16	2 bytes			
1	Leaf	04	01	03	02	02	00	00	00	Active Lines per Frame	Specifies the total number of lines (rows) in the active portion of a frame in the video pixel matrix.	UInt16	2 bytes			
1	Leaf	04	01	03	02	03	00	00	00	Leading Lines	Specifies the number of leading lines in the processed image to be blanked before display	Int32	4 bytes		W25.52	
1	Leaf	04	01	03	02	04	00	00	00	Trailing Lines	Specifies the number of trailing lines in the processed image to be blanked before display	Int32	4 bytes		W25.52	
	Node	04	01	03	03	00	00	00	00	Horizontal parameters	Horizontal scanning information					
	Node	04	01	04	00	00	00	00	00	Analogue Video Coding Characteristics	Information about the analogue coding of the essence					
1	Leaf	04	01	04	01	00	00	00	00	Analogue Video System	PAL, NTSC etc.	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	4 chars max	See types dictionary		
	Node	04	01	05	00	00	00	00	00	Digital Video/Image Coding Parameters	Information about the essence digital coding					
	Node	04	01	05	01	00	00	00	00	Digital Video/Image Sampling Parameters	Information about the digital sampling					
1	Leaf	04	01	05	01	01	00	00	00	Luminance Sample rate	The luminance sample rate	UInt8	1 byte	See types dictionary		
1	Leaf	04	01	05	01	02	00	00	00	Active Samples per Line	Total number of samples (columns) in the active portion of a line in the video pixel matrix.	UInt16	2 bytes			
1	Leaf	04	01	05	01	03	00	00	00	Total Samples per Line	Specifies the number of samples in a total line in the video pixel matrix.	UInt16	2 bytes			
1	Leaf	04	01	05	01	04	00	00	00	Sampling Hierarchy Code	A code that specifies the component sampling hierarchy for the video pixel matrix.	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	4 chars max	See types dictionary		
1	Leaf	04	01	05	01	05	00	00	00	Horizontal Sub-sampling	Specifies ratio of luminance subsampling to chrominance subsampling in horizontal direction	UInt32	4 bytes		W25.52	
1	Leaf	04	01	05	01	06	00	00	00	Colour Siting	Specifies how to compute subsampled chrominance values	ColorSitingType	2 bytes		W25.52	
1	Leaf	04	01	05	01	07	00	00	00	Sampled Height	Specifies the integer height of the sampled image in pixels	UInt32	4 bytes		W25.52	
1	Leaf	04	01	05	01	08	00	00	00	Sampled Width	Specifies the integer width of the sampled image in pixels	UInt32	4 bytes		W25.52	
1	Leaf	04	01	05	01	09	00	00	00	Sampled X-offset	Specifies the X offset of the sampled image in pixels expressed as two bytes integer plus two bytes fractional	Int32	4 bytes		W25.52	
1	Leaf	04	01	05	01	0A	00	00	00	Sampled Y-offset	Specifies the Y offset of the sampled image in pixels expressed as two bytes integer plus two bytes fractional	Int32	4 bytes		W25.52	
1	Leaf	04	01	05	01	0B	00	00	00	Presentation Height	Specifies the height of the presented image in pixels	UInt32	4 bytes		W25.52	
1	Leaf	04	01	05	01	0C	00	00	00	Presentation Width	Specifies the width of the presented image in pixels	UInt32	4 bytes		W25.52	
1	Leaf	04	01	05	01	0D	00	00	00	Presentation X-offset	Specifies the X offset of the presented image in pixels expressed as two bytes integer plus two bytes fractional	Int32	4 bytes		W25.52	
1	Leaf	04	01	05	01	0E	00	00	00	Presentation Y-offset	Specifies the Y offset of the presented image in pixels expressed as two bytes integer plus two bytes fractional	Int32	4 bytes		W25.52	
1	Leaf	04	01	05	01	0F	00	00	00	Filtering Code	Specifies the spectral filtering that has been applied to the digital samples of the video signal.	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	4 chars max	See types dictionary		
	Node	04	01	05	02	00	00	00	00	Digital Video/Image Storage Parameters	Information about image storage parameters.					
1	Leaf	04	01	05	02	01	00	00	00	Stored Height	Specifies the integer height of the stored image in pixels	UInt32	4 bytes		W25.52	
1	Leaf	04	01	05	02	02	00	00	00	Stored Width	Specifies the integer width of the stored image in pixels	UInt32	4 bytes		W25.52	
	Node	04	01	05	03	00	00	00	00	Digital Quantisation and Level Parameters	Information about the digital quantisation and levels					
1	Leaf	04	01	05	03	01	00	00	00	Bits Per Pixel	The maximum number of significant bits for the value in each band of each pixel without compression.	UInt8	1 byte			

Dictionary Version at introduction	Node or Leaf	SMPTE label (last 8 octets following Metadata Dictionary Universal Label)								Data Element Name	Data Element Definition	Type	Value Length	Value Range	Defining Document	Notes
1	Leaf	04	01	05	03	02	00	00	00	Rounding Method Code	Specifies the rounding method that has been applied to the digital samples of the video signal.	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	4 chars max	See types dictionary		
1	Leaf	04	01	05	03	03	00	00	00	Black Reference Level	Specifies digital luminance associated with black	UInt32	4 bytes		W25.52	
1	Leaf	04	01	05	03	04	00	00	00	White Reference Level	Specifies digital luminance associated with white	UInt32	4 bytes		W25.52	
	Node	04	01	06	00	00	00	00	00	Digital Video/Image Compression Parameters	Information about the digital video compression scheme used (MPEG, DV etc)					
	Node	04	01	06	02	00	00	00	00	MPEG Coding Parameters	Information about MPEG video coding					
	Node	04	01	06	02	01	00	00	00	MPEG-2 Coding Parameters	Information about MPEG coding					
1	Leaf	04	01	06	02	01	01	00	00	Field Frame Type Code	Identifies the field or frame type of the source video image for video derived from compressed sources. Eg, I B or P	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	1 char	See types dictionary		
	Node	04	01	08	00	00	00	00	00	Film to Video characteristics	Information about transferring Film to Video					
	Node	04	01	08	01	00	00	00	00	Film Pulldown characteristics	Film transfer pulldown characteristics					
1	Leaf	04	01	08	01	01	00	00	00	Pulldown sequence	eg, 3:2, 1:1 at 25Hz, 1:1 at 59.94Hz, 24Hz/25Hz, Videotap, etc	PulldownKind	1 byte	See types dictionary		
1	Leaf	04	01	08	01	02	00	00	00	Field Dominance	Field one dominant (True)	Boolean	1 byte	00h (FALSE) or FFh (TRUE)		
1	Leaf	04	01	08	01	03	00	00	00	Video/Film Frame Relationship (A Frame Sequence)	Specifies temporal correlation between video fields/frames and film frames from which they were derived	UInt8	1 byte	00000001 through 00001010	RP-186 4.3.2; RP-197 7.5.3	
	Node	04	01	08	02	00	00	00	00	Film Frame Rates	Frame per second film frame rate					
1	Leaf	04	01	08	02	01	00	00	00	Capture Film Frame rate	eg 24.00 fps	Unsigned Char	1 byte	See types dictionary		
1	Leaf	04	01	08	02	02	00	00	00	Transfer Film Frame rate	eg 23.976 fps	Unsigned Char	1 byte	See types dictionary		
	Node	04	01	10	00	00	00	00	00	Image test parameters	Test information from the original imagery					
	Node	04	01	10	01	00	00	00	00	Video test parameters	Video information from the original recording					
1	Leaf	04	01	10	01	01	00	00	00	Test parameter	eg, Starting Bit Error Rate, Maximum BER Tolerance Level, Sharpness Quality Benchmark, Scalar Based Quality Parameter, Spatial Quality Information, Temporal Quality Information, Matrix Based Quality Parameter	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
1	Leaf	04	01	10	01	02	00	00	00	Test Result (real)	The result from the specified test	Floating Point	4 bytes			
1	Leaf	04	01	10	01	03	00	00	00	Test Result (integer)	The result from the specified test	UInt32	4 bytes			
	Node	04	01	10	02	00	00	00	00	Film test Parameters	Film test information from the original recording					
1	Leaf	04	01	10	02	01	00	00	00	Test parameter	eg, Film Frequency Response; Telecine Gamma Correction; Macbeth Color Checker, Telecine Gray Scale Mirror; Lab Aim Density; Lab Aim Density Red/Green/Blue; Lab Aim Density Red/Green/Blue Dmin; etc	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
1	Leaf	04	01	10	02	02	00	00	00	Test Result (real)	The result from the specified test	Floating Point	4 bytes			
1	Leaf	04	01	10	02	03	00	00	00	Test Result (integer)	The result from the specified test	SIMSBF	4 bytes			
	Node	04	02	00	00	00	00	00	00	Audio Essence Characteristics	Operating characteristics of the device creating the audio essence.					
	Node	04	02	01	00	00	00	00	00	Fundamental Audio Characteristics	Fundamental audio characteristics					
	Node	04	02	01	01	00	00	00	00	Audio formulation	number of recording channels used, analogue or digital recording device, analog or digital mixing console					
1	Leaf	04	02	01	01	01	00	00	00	Electro-spatial formulation	Mono, Dual mono, Stereo A+B, Stereo M&S, Dolby surround, MPEG BC/NBC etc	UInt8	1 byte	See types dictionary		
1	Leaf	04	02	01	01	02	00	00	00	Filtering applied	eg, Academy, flat etc	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
1	Leaf	04	02	01	01	03	00	00	00	Audio reference level	Number of Dbm for 0VU	Int8	1 byte			

Dictionary Version at introduction	Node or Leaf	SMPTE label (last 8 octets following Metadata Dictionary Universal Label)								Data Element Name	Data Element Definition	Type	Value Length	Value Range	Defining Document	Notes
	Node	04	02	01	01	10	00	00	00	Audio mix	The number of audio channels in the mix					
1	Leaf	04	02	01	01	10	01	00	00	Mono channels	The number of mono channels in the mix	UInt8	1 byte	1 to 255		
1	Leaf	04	02	01	01	10	02	00	00	Stereo channels	The number of stereo channels in the mix	UInt8	1 byte	1 to 255		
	Node	04	02	02	00	00	00	00	00	Analogue Audio Coding Parameters	Information about the original analogue coding of the essence					
1	Leaf	04	02	02	01	00	00	00	00	Analogue system	Flat, Dolby-A etc	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
	Node	04	02	03	00	00	00	00	00	Digital Audio Coding Parameters	Information about the essence digital coding					
	Node	04	02	03	01	00	00	00	00	Digital Sampling Parameters	Information about the digital sampling					
1	Leaf	04	02	03	01	01	00	00	00	Audio Sample rate	The tabulated reference clock frequency	UInt8	1 byte	See types dictionary		
	Node	04	02	03	02	00	00	00	00	Digital Audio Storage Parameters	Information about image storage parameters					
	Node	04	02	03	03	00	00	00	00	Digital Quantisation and Level Parameters	Information about the digital quantisation and levels					
1	Leaf	04	02	03	03	01	00	00	00	Bits per Sample	The maximum number of significant bits for the value without compression	UInt8	1 byte			
1	Leaf	04	02	03	03	02	00	00	00	Rounding law	The rounding law applied	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	4 chars max	See types dictionary		
1	Leaf	04	02	03	03	03	00	00	00	Dither	rectangular, triangular PD	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	4 chars max	See types dictionary		
	Node	04	02	04	00	00	00	00	00	Digital Audio Compression Parameters	Information about the digital audio compression scheme used (MPEG, Dolby etc)					
	Node	04	02	04	03	00	00	00	00	MPEG Coding Parameters	Information about MPEG audio coding					
	Node	04	02	04	03	01	00	00	00	MPEG-1 Coding Parameters	Information about MPEG audio coding					
	Node	04	02	08	00	00	00	00	00	Film Sound source	Indicates the film sound source					
1	Leaf	04	02	08	01	00	00	00	00	Optical track	The kind of optical track from which the sound was recovered	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
1	Leaf	04	02	08	02	00	00	00	00	Magnetic track	The kind of magnetic track from which the sound was recovered	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
	Node	04	02	10	00	00	00	00	00	Audio test parameters	Audio test parameters from the original recording					
1	Leaf	04	02	10	01	00	00	00	00	Signal to noise ratio	The measured signal to noise ratio of the original recording	Floating Point	4 bytes			
1	Leaf	04	02	10	02	00	00	00	00	Weighting	The weighting used in measurements	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	4 chars max	See types dictionary		
	Node	04	03	00	00	00	00	00	00	Data Essence Characteristics	Operating characteristics of the device creating the data essence.					
	Node	04	03	01	00	00	00	00	00	Fundamental Data Essence Parameters	Fundamental data essence characteristics					
	Node	04	03	02	00	00	00	00	00	Analogue Data Essence Coding Parameters	Information about the analogue coding of the data essence					
1	Leaf	04	03	02	01	00	00	00	00	Analogue Data Coding Kind	eg. Teletext	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	4 chars max	See types dictionary		
	Node	04	03	03	00	00	00	00	00	Digital Data Essence Coding Parameters	Information about the data essence digital coding					
	Node	04	03	10	00	00	00	00	00	Data Essence test parameters	Data test parameters from the original recording					
	Node	04	04	00	00	00	00	00	00	Metadata Characteristics	Operating characteristics of the device creating the metadata					
	Node	04	04	01	00	00	00	00	00	Fundamental Metadata Characteristics	Fundamental Metadata characteristics					
	Node	04	04	01	01	00	00	00	00	Timecode Characteristics	Characteristics of timecode metadata					
1	Leaf	04	04	01	01	01	00	00	00	Timecode Kind (Default = SMPTE12M)	eg. EBU, 309M, 12M etc	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	4 chars max	See types dictionary		

Dictionary Version at introduction	Node or Leaf	SMPTE label (last 8 octets following Metadata Dictionary Universal Label)								Data Element Name	Data Element Definition	Type	Value Length	Value Range	Defining Document	Notes
1	Leaf	04	04	01	01	02	00	00	00	Timecode Timebase	eg. 24, 25, 30, 60, 48	UInt8	1 byte	See types dictionary		
1	Leaf	04	04	01	01	03	00	00	00	Timecode User bits flag	User bits active = True	Boolean	1 byte	00h (FALSE), FFh (TRUE)		
1	Leaf	04	04	01	01	04	00	00	00	Include Sync	Specifies whether synchronization data is included in SMPTE 12M Timecode	Boolean	1 byte		W25.52	
1	Leaf	04	04	01	01	05	00	00	00	Drop Frame	Specifies whether timecode is drop frame (Non-drop Frame = 0)	Boolean	1 byte	00h (FALSE) or FFh (TRUE)	W25.52	
	Node	04	04	02	00	00	00	00	00	Analogue Metadata Coding Characteristics	Information about the analogue coding of the metadata					
1	Leaf	04	04	02	01	00	00	00	00	Timecode Source Type	Specifies whether timecode is LTC or VITC	TCSource	2 bytes	See types dictionary	W25.52	
1	Leaf	04	04	02	02	00	00	00	00	Analogue Metadata Carrier	eg. Teletext	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	4 chars max	See types dictionary		
	Node	04	04	03	00	00	00	00	00	Digital Metadata Coding Characteristics	Information about the metadata digital coding					
1	Leaf	04	04	03	01	00	00	00	00	Digital Metadata Carrier	The metadata coding type - eg. Digital VBI, AES-3	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	4 chars max	See types dictionary		
	Node	04	04	10	00	00	00	00	00	Metadata test parameters	Data test parameters from the original recording					
	Node	04	05	00	00	00	00	00	00	Monitoring & Control Characteristics	Operating characteristics of the device creating the system and control information					
	Node	04	05	01	00	00	00	00	00	Fundamental Monitoring & Control Characteristics	Fundamental Monitoring and Control characteristics					
	Node	04	05	02	00	00	00	00	00	Analogue Monitoring & Control Coding Characteristics	Information about the original analogue coding of the data					
1	Leaf	04	05	02	01	00	00	00	00	Analogue Monitoring & Control Coding Kind	eg. Teletext	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	4 chars max	See types dictionary		
	Node	04	05	03	00	00	00	00	00	Digital Monitoring & Control Coding Parameters	Information about the original digital coding of the data					
	Node	04	05	03	01	00	00	00	00	Digital Monitoring & Control Sampling Parameters	Information about the Monitoring and Control metadata digital sampling					
	Node	04	05	10	00	00	00	00	00	Monitoring & Control test parameters	Monitoring and Control metadata test parameters from the original recording					
	Node	04	06	00	00	00	00	00	00	General Coding Characteristics	Characteristics that apply to more than one type of essence or metadata					
	Node	04	06	01	00	00	00	00	00	General Essence Coding Characteristics	Characteristics that apply to more than one type of essence					
1	Leaf	04	06	01	01	00	00	00	00	Sample Rate	Specifies the sample rate of essence (any kind)	Rational	8 bytes		W25.52	
1	Leaf	04	06	01	02	00	00	00	00	Length	Specifies the number of samples of essence data (any kind)	Length	8 bytes		W25.52	
	Node	04	08	00	00	00	00	00	00	Object Characteristics						
	Node	04	10	00	00	00	00	00	00	Medium Characteristics	Characteristics describing the medium containing the essence for transport or storage					
	Node	04	10	01	00	00	00	00	00	Storage Medium parameters	Characteristics that describe the physical medium such as cartridge size					
	Node	04	10	01	01	00	00	00	00	Tape Medium Parameters	Characteristics of Tape medium					
	Node	04	10	01	02	00	00	00	00	Disc medium parameters	Characteristics of Disc medium					
	Node	04	10	01	03	00	00	00	00	Film Medium Parameters	Information about the physical film medium					
	Node	04	10	01	03	01	00	00	00	Generic Film Medium Parameters	Generic Information about the film medium					
1	Leaf	04	10	01	03	01	01	00	00	Film Colour Process	The film colouring process used. Eg Pathe Colour, Hand Colouring, Berthon Keller Dorian Lenticular Process	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
1	Leaf	04	10	01	03	01	02	00	00	Edge Code Format	Specifies the edge code format	EdgeType	2 bytes	See types dictionary	W25.52	

Dictionary Version at Introduction	Node or Leaf	SMPTE label (last 8 octets following Metadata Dictionary Universal Label)								Data Element Name	Data Element Definition	Type	Value Length	Value Range	Defining Document	Notes
1	Leaf	04	10	01	03	01	04	00	00	Film gauge and format	The gauge and format of the film eg Neg; Blair Vivoscope	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
1	Leaf	04	10	01	03	01	05	00	00	Film Stock type	eg. 5247	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
1	Leaf	04	10	01	03	01	06	00	00	Film stock manufacturer	eg Kodak, Ilford	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
	Node	04	10	01	03	02	00	00	00	Specific Film Medium Parameters	Specific Information about the film medium					
1	Leaf	04	10	01	03	02	01	00	00	Physical Media length (metres)	The physical length of the medium on which the essence was captured	UIMSBF	4 bytes			
1	Leaf	04	10	01	03	02	02	00	00	Film capture aperture	eg super 16, academy etc	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
	Node	04	20	00	00	00	00	00	00	Device Characteristics	Information about the devices used					
	Node	04	20	01	00	00	00	00	00	Camera Characteristics	Information about camera devices					
	Node	04	20	01	01	00	00	00	00	Image Characteristics	The specific category of imagery					
1	Leaf	04	20	01	01	01	00	00	00	Image Category	Identifies the specific category of imagery (often revealing the nature of the collector or intended use). Format is as defined in NITF v2.0 in addition to those defined here.	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
	Node	04	20	01	02	01	00	00	00	Image Devices	Information about the image device					
1	Leaf	04	20	01	02	01	01	00	00	Image Source Device	Indicates the type of the image source.	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
	Node	04	20	02	00	00	00	00	00	Optical Characteristics	Information about optics					
	Node	04	20	02	01	00	00	00	00	Optical Test parameters	Optical test parameters from the original recording					
	Node	04	20	02	01	01	00	00	00	Optical Device Parameters	Information about the optical device used (eg lens, iris block)					
1	Leaf	04	20	02	01	01	01	00	00	Test parameter	The specific parameter under test, e.g. Flare	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
1	Leaf	04	20	02	01	01	02	00	00	Test Result (real)	The result from the specified test	Floating Point	4 bytes			
1	Leaf	04	20	02	01	01	03	00	00	Test Result (integer)	The result from the specified test	UInt32	4 bytes			
	Node	04	20	03	00	00	00	00	00	Microphone Characteristics	Information about microphones used					
	Leaf	04	20	03	01	00	00	00	00	Sensor type	transducer principle	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	4 chars max	See types dictionary		
1	Leaf	04	20	03	02	00	00	00	00	Polar characteristic	polar patterns	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
	Node	05	00	00	00	00	00	00	00	PROCESS	Class 5 is reserved for information about the essence or metadata processing					
	Node	05	01	00	00	00	00	00	00	General Process Indicators	Flags etc indicating the process status of the essence					
	Node	05	01	01	00	00	00	00	00	Fundamental	Information about process fundamentals					
1	Leaf	05	01	01	01	00	00	00	00	Integration Indication	A term that describes what the essence is as a unit status of the essence. Terms must be consistent with industry or organizational practices to be useful. Includes segment, clip, shot, item, programme etc.	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
1	Leaf	05	01	01	02	00	00	00	00	Event Indication	A term that describes what the Event is as a part of the Process. Terms must be consistent with industry or organizational practices to be useful. Includes project, mission, scene, in-points, trigger points, license, option, publication, cataloguing etc.	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
1	Leaf	05	01	01	03	00	00	00	00	Quality Flag	Quality of a specific recording/physical copy (good/no good)	Boolean	1 byte	00h (NO GOOD), FFh (GOOD)		

Dictionary Version at introduction	Node or Leaf	SMPTE label (last 8 octets following Metadata Dictionary Universal Label)								Data Element Name	Data Element Definition	Type	Value Length	Value Range	Defining Document	Notes
1	Leaf	05	01	01	05	00	00	00	00	Physical Instance Category	Category of physical copy (e.g., master copy, copy, broadcast copy)	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
	Node	05	01	02	00	00	00	00	00	Content Capture	Information about how content was captured					
1	Leaf	05	01	02	01	00	00	00	00	Digital or analogue origination	The nature of the first capture of the material	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
	Node	05	01	02	02	00	00	00	00	Video/Image Capture process	Information about how video content was captured					
	Node	05	01	02	03	00	00	00	00	Film Capture Process	Information about how film content was captured					
	Node	05	01	02	04	00	00	00	00	Audio Capture Process	Information about how audio content was captured					
1	Leaf	05	01	02	04	01	00	00	00	Microphone Placement techniques	spaced omnies, spaced cardioids, close miking	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
	Node	05	01	02	05	00	00	00	00	Data Capture Process	Information about how data content was captured					
	Node	05	01	03	00	00	00	00	00	Manipulation	Information about content manipulation					
1	Leaf	05	01	03	01	00	00	00	00	Simple Flagging	The number of alterations to the original file	UInt16	2 bytes			
1	Leaf	05	01	03	02	00	00	00	00	Copy Number	The number of copies (i.e. not lossless clones)	UInt8	1 byte	1 to 255		
1	Leaf	05	01	03	03	00	00	00	00	Clone number	The number of clones (i.e. digitally lossless copies)	UInt8	1 byte	1 to 255		
1	Leaf	05	01	03	04	00	00	00	00	Work in Progress Flag	Is the essence a work in progress? Work-in progress = True	Boolean	1 byte	00h (FALSE), FFh (TRUE)		
	Node	05	02	00	00	00	00	00	00	Compression Processing	Information about payload compression.					
	Node	05	02	01	00	00	00	00	00	Video/Image Compression	Information about video or image compression.					
1	Leaf	05	02	01	01	00	00	00	00	Video/Image Compression Algorithm	Algorithm used to compress the video or image content.	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	4 chars max	See types dictionary		
	Node	05	02	01	02	00	00	00	00	MPEG Processing	MPEG processing performed on the essence					
	Node	05	02	01	02	01	00	00	00	MPEG-2 Processing	MPEG processing performed on the essence					
1	Leaf	05	02	01	02	01	01	00	00	Splicing Metadata	MPEG-2 splicing metadata as defined in SDTI-CP (E&M) and SMPTE 312M	as per SDTI-CP (E&M) and SMPTE 312M standard	Variable		SMPTE 331M	
	Node	05	02	02	00	00	00	00	00	Audio Compression	Information about audio compression.					
1	Leaf	05	02	02	01	00	00	00	00	Audio Compression Algorithm	Algorithms used, bitrates used, modes used.	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	4 chars max	See types dictionary		
	Node	05	02	03	00	00	00	00	00	Data Essence Compression	Information about data essence compression.					
	Node	05	02	04	00	00	00	00	00	Metadata Compression	Information about metadata compression.					
	Node	05	03	00	00	00	00	00	00	Noise Reduction Processing	Information about any noise reduction process					
	Node	05	03	01	00	00	00	00	00	Video noise reduction	Information about any video noise reduction process					
1	Leaf	05	03	01	01	00	00	00	00	Video Noise Reduction Algorithm	Algorithm used in a noise reduction process	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	4 chars max	See types dictionary		
	Node	05	03	02	00	00	00	00	00	Audio noise reduction	Information about any video noise reduction process					
1	Leaf	05	03	02	01	00	00	00	00	Audio Noise Reduction Algorithm	Algorithm used in a noise reduction process - eg Dolby SR, Telcom, other	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	4 chars max	See types dictionary		
	Node	05	20	00	00	00	00	00	00	Enhancement or Modification	Enhancement or modification to the essence					
	Node	05	20	01	00	00	00	00	00	Image Essence processing	Enhancement or modification to the image essence					
1	Leaf	05	20	01	01	00	00	00	00	Enhancement or Modification Description	Description of how video content was modified.	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	127 bytes max			

Dictionary Version at Introduction	Node or Leaf	SMPTE label (last 8 octets following Metadata Dictionary Universal Label)								Data Element Name	Data Element Definition	Type	Value Length	Value Range	Defining Document	Notes
	Node	05	20	02	00	00	00	00	00	Video processor settings (Device-specific)	The settings of a specific device in the system					
1	Leaf	05	20	02	01	00	00	00	00	Device kind	Specific description for a device - eg for the film camera, film grading, video camera, variable gain amplifier etc	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
1	Leaf	05	20	02	02	00	00	00	00	Device parameter	Specific parameter for the specified device eg. Overall gain, Red lift, coring	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
1	Leaf	05	20	02	03	00	00	00	00	Device parameter setting	The setting of the specific parameter for the specified device	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
	Node	05	20	03	00	00	00	00	00	Audio Essence Processing	Enhancement or modification to the audio essence					
1	Leaf	05	20	03	01	00	00	00	00	Enhancement or Modification Description	Description of how audio content was modified.	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	127 bytes max			
1	Leaf	05	20	03	02	00	00	00	00	Audio First Mix-down process	The way in which the first mix down was done	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
	Node	05	20	04	00	00	00	00	00	Audio processor settings (Device-specific)	The settings of a specific device in the system					
1	Leaf	05	20	04	01	00	00	00	00	Device kind	Specific description for a device - eg The Compressor, limiter, etc	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
1	Leaf	05	20	04	02	00	00	00	00	Device parameter	Specific parameter for the specified device eg. Attack, gating	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
1	Leaf	05	20	04	03	00	00	00	00	Device parameter setting	The setting of the specific parameter for the specified device	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
	Node	05	20	05	00	00	00	00	00	Data Essence Processing	Enhancement or modification to the data essence					
1	Leaf	05	20	05	01	00	00	00	00	Enhancement or Modification Description	Description of how data content was modified.	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	127 bytes max			
	Node	05	20	06	00	00	00	00	00	Data processor settings (Device-specific)	The settings of a specific device in the system					
1	Leaf	05	20	06	01	00	00	00	00	Device kind	Specific description for a device	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
1	Leaf	05	20	06	02	00	00	00	00	Device parameter	Specific parameter for the specified device	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
1	Leaf	05	20	06	03	00	00	00	00	Device parameter setting	The setting of the specific parameter for the specified device	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
	Node	05	20	07	00	00	00	00	00	Metadata Processing	Enhancement or modification to the metadata					
	Node	05	20	08	00	00	00	00	00	Metadata processor settings (Device-specific)	The settings of a specific device in the system					
	Node	05	30	00	00	00	00	00	00	Editing Information	Information about alterations to the original image stream to produce new editorial material.					
	Node	05	30	01	00	00	00	00	00	Editing version information	Information about the version of the edit					
	Node	05	30	02	00	00	00	00	00	Editing decision information	Information about editing decisions.					
1	Leaf	05	30	02	01	00	00	00	00	Default Fade Type	Specifies the default fade type for audio soft cuts	FadeType	2 bytes		W25.52	
	Node	05	30	03	00	00	00	00	00	Editing matte information	Information about editing mattes					
	Node	05	30	04	00	00	00	00	00	Editing event information	Information about editing events					
1	Leaf	05	30	04	01	00	00	00	00	Active State	Specifies whether the device is active or not as a result of the event (Inactive = False)	Boolean	1 byte	00h (FALSE) or FFh (TRUE)	W25.52	
	Node	05	30	05	00	00	00	00	00	Editing effect information	Information about editing effects					
1	Leaf	05	30	05	01	00	00	00	00	Fade In Type	Specifies type of audio fade in	FadeType	2 bytes		W25.52	
1	Leaf	05	30	05	02	00	00	00	00	Fade Out Type	Specifies type of audio fade out	FadeType	2 bytes		W25.52	
1	Leaf	05	30	05	03	00	00	00	00	Speed Change Effect	Specifies whether the effect changes the perceived speed of the essence (Slow-motion, fast-motion, and freeze effects = True)	Boolean	1 byte	00h (FALSE) or FFh +0580(TRUE)	W25.52	
1	Leaf	05	30	05	04	00	00	00	00	Number of Inputs	Specifies the number of input segments	Int32	4 bytes		W25.52	
1	Leaf	05	30	05	05	00	00	00	00	Bypass	Specifies default input to play	UInt32	4 bytes		W25.52	
	Node	05	30	06	00	00	00	00	00	Editing web information	Information about editing for web output					

Dictionary Version at introduction	Node or Leaf	SMPTE label (last 8 octets following Metadata Dictionary Universal Label)								Data Element Name	Data Element Definition	Type	Value Length	Value Range	Defining Document	Notes
	Node	05	30	07	00	00	00	00	00	Editing user notes	Information about editing user notes					
	Node	05	40	00	00	00	00	00	00	Processing History	Audit history of compression for payload.					
	Node	05	40	01	00	00	00	00	00	Video Compression History	Audit history of compression for video payload.					
1	Leaf	05	40	01	01	00	00	00	00	Video Compression Algorithm	Algorithm used to compress video content.	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	4 chars max	See types dictionary		
1	Leaf	05	40	01	02	00	00	00	00	MPEG Video recoding dataset	Audit history of video coding - see SMPTE327.	as per SMPTE327 standard	Variable			
	Node	05	40	02	00	00	00	00	00	Audio Compression History	Audit history of compression for audio payload.					
1	Leaf	05	40	02	01	00	00	00	00	Audio Compression Algorithm	Algorithms used, bitrates used, modes used.	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	4 chars max	See types dictionary		
1	Leaf	05	40	02	02	00	00	00	00	MPEG Audio recoding dataset	Audio coding history as per SMPTEXXXX	as per SMPTEXXXX standard	Variable			
	Node	05	40	03	00	00	00	00	00	Data Compression History	Audit history of compression for payload.					
	Node	05	40	04	00	00	00	00	00	Metadata Compression History	Audit history of compression for payload.					
	Node	06	00	00	00	00	00	00	00	RELATIONAL	Class 6 is reserved for information about the relationships between data					
	Node	06	01	00	00	00	00	00	00	Generic Relationships	Specifies relationships which are generic between items					
	Node	06	01	01	00	00	00	00	00	Essence and Metadata Relationships	Type of relation (e.g., is part of, is an item of [programme, series], remix, remake, ...)					
	Node	06	01	01	01	00	00	00	00	Essence to Essence	The relationship value in terms of Parent of; Child of; Item of; Excerpt of; Version of; Compilation of; etc.					
	Node	06	01	01	02	00	00	00	00	Metadata to Essence	The relationship between metadata and essence					
	Node	06	01	01	03	00	00	00	00	Metadata to Metadata	The relationship value in terms of Parent of; Child of;					
	Node	06	01	01	04	00	00	00	00	Object to Object	The relationship value in terms of Parent of; Child of; Item of;					
	Node	06	01	01	05	00	00	00	00	Metadata to Object	The relationship between metadata and an object					
	Node	06	02	00	00	00	00	00	00	Related production material	Related production material					
1	Leaf	06	02	01	00	00	00	00	00	Reference to programme support material	eg printed educational material	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	127 bytes max			
1	Leaf	06	02	02	00	00	00	00	00	Reference to programme advertising material	eg printed advertising material	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	127 bytes max			
1	Leaf	06	02	03	00	00	00	00	00	Reference to programme commercial material	eg. Mugs, T-shirts, recordings	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	127 bytes max			
	Node	06	08	00	00	00	00	00	00	Stream and Storage Relationships	Relationships between data in streams and persistent storage					
	Node	06	08	01	00	00	00	00	00	Stream Relationships	Relationships between data in streams					
	Node	06	08	02	00	00	00	00	00	Storage Relationships	Relationships between data in persistent storage					
1	Leaf	06	08	02	01	00	00	00	00	Contiguous Data	Specifies if the data is stored in contiguous bytes (False=0)	Boolean	1 byte	00h (FALSE) or FFh (TRUE)	W25.52	
	Node	06	10	00	00	00	00	00	00	Numerical sequence	Information about numerical sequences					

Dictionary Version at Introduction	Node or Leaf	SMPTE label (last 8 octets following Metadata Dictionary Universal Label)								Data Element Name	Data Element Definition	Type	Value Length	Value Range	Defining Document	Notes
1	Leaf	06	10	01	00	00	00	00	00	Numerical position in sequence	1, 2, 3 etc	UInt32	4 bytes			
1	Leaf	06	10	02	00	00	00	00	00	Relative position in sequence (value)	Numerical offset	Int32	4 bytes			
1	Leaf	06	10	03	00	00	00	00	00	Relative position in sequence (descriptive)	Specifies relative Position in Sequence (previous, next etc)	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
	Node	07	00	00	00	00	00	00	00	SPATIO-TEMPORAL	Class is reserved for information about space and time					
	Node	07	01	00	00	00	00	00	00	Position and Space Vectors	Information about position in space and associated vectors (if any)					
	Node	07	01	01	00	00	00	00	00	Positional System Information	Information about absolute system in use					
1	Leaf	07	01	01	01	00	00	00	00	Image Coordinate System	Indicates the geo-referenced coordinate system for the image.	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	4 chars max	See types dictionary		
1	Leaf	07	01	01	02	00	00	00	00	Map Datum Used	Identifies the map datum used to derive the coordinates (UTM or GEO).	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	4 chars max	See types dictionary		
	Node	07	01	02	00	00	00	00	00	Positional Information	Information about absolute and relative position in space					
	Node	07	01	02	01	00	00	00	00	Absolute Position	Absolute positional information					
	Node	07	01	02	01	01	00	00	00	Local Datum Absolute Position	The absolute position of a local datum					
1	Leaf	07	01	02	01	01	01	00	00	Local Datum Absolute Position Accuracy	The accuracy with which the measurement of absolute position of the local datum is made, (default metres)	Floating Point	4 bytes			
	Node	07	01	02	01	02	00	00	00	Device Absolute Position	The absolute position of the essence-capturing device					
1	Leaf	07	01	02	01	02	01	00	00	Device Absolute Positional Accuracy	Accuracy of frame center coordinates as a Circular Error Probable (CEP) (50%), (default metres)	Floating Point	4 bytes			
1	Leaf	07	01	02	01	02	02	00	00	Device Altitude	Altitude of sensor as measured from Mean Sea Level (MSL), (default metres)	Floating Point	4 bytes			
1	Leaf	07	01	02	01	02	02	01	00	Device Altitude (concise)	Altitude of sensor as measured from Mean Sea Level (MSL), (default metres)	Binary	4 bytes	As per SMPTE 330M (UMID)	SMPTE 330M	
1	Leaf	07	01	02	01	02	04	00	00	Device Latitude	Specifies a sensor's geographic location in decimal degrees of latitude. Positive values indicate northern hemisphere; negative values indicate southern hemisphere.	Floating Point	4 bytes			
1	Leaf	07	01	02	01	02	04	01	00	Device Latitude (degrees, concise)	Specifies a sensor's geographic location in decimal degrees of latitude. Positive values indicate northern hemisphere; negative values indicate southern hemisphere.	Binary	4 bytes	As per SMPTE 330M (UMID)	SMPTE 330M	
1	Leaf	07	01	02	01	02	06	00	00	Device Longitude	Specifies a sensor's geographic location in decimal degrees of longitude. Positive values indicate eastern hemisphere, negative values indicate western hemisphere.	Floating Point	4 bytes			
1	Leaf	07	01	02	01	02	06	01	00	Device Longitude (degrees, concise)	Specifies a sensor's geographic location in decimal degrees of longitude. Positive values indicate eastern hemisphere, negative values indicate western hemisphere.	Binary	4 bytes	As per SMPTE 330M (UMID)	SMPTE 330M	
1	Leaf	07	01	02	01	02	10	00	00	Device X Dimension	Specifies the sensor location along the x-axis in Earth Centered, Earth Fixed (ECEF) Cartesian coordinates, (default metres)	Floating Point	4 bytes			
1	Leaf	07	01	02	01	02	11	00	00	Device Y Dimension	Specifies the sensor location along the y-axis in Earth Centered, Earth Fixed (ECEF) Cartesian coordinates, (default metres)	Floating Point	4 bytes			
	Node	07	01	02	01	03	00	00	00	Subject Absolute Position	The absolute position of the subject depicted in the essence					
1	Leaf	07	01	02	01	03	01	00	00	Frame Positional Accuracy	Accuracy of frame center coordinates as a Circular Error Probable (CEP) (50%), (default metres)	Floating Point	4 bytes			
1	Leaf	07	01	02	01	03	02	00	00	Frame Center Latitude	Specifies the video frame center point geographic location in decimal degrees of latitude. Positive values indicate northern hemisphere; negative values indicate southern hemisphere.	Floating Point	4 bytes			

Dictionary Version at introduction	Node or Leaf	SMPTE label (last 8 octets following Metadata Dictionary Universal Label)								Data Element Name	Data Element Definition	Type	Value Length	Value Range	Defining Document	Notes
1	Leaf	07	01	02	01	03	03	00	00	Frame Center Latitude (degrees, concise)	Specifies the video frame center point geographic location in decimal degrees of latitude. Positive values indicate northern hemisphere; negative values indicate southern hemisphere.	Binary	4 bytes	As per SMPTE 330M +Q523UMID)	SMPTE 330M	
1	Leaf	07	01	02	01	03	04	00	00	Frame Center Longitude	Specifies the video frame center point geographic location in decimal degrees of longitude. Positive values indicate eastern hemisphere; negative values indicate western hemisphere.	Floating Point	4 bytes			
1	Leaf	07	01	02	01	03	05	00	00	Frame Center Longitude (degrees, concise)	Specifies the video frame center point geographic location in decimal degrees of longitude. Positive values indicate eastern hemisphere; negative values indicate western hemisphere.	Binary	4 bytes	As per SMPTE 330M (UMID)	SMPTE 330M	
1	Leaf	07	01	02	01	03	06	00	00	Frame Center Lat-Long	Specifies a video frame center point geographic location Latitude and Longitude.	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	14 bytes	Specified format (see notes)		Format is ddmmsXddmmsY, where "dd" is degrees latitude, "dd" is degrees longitude, "mm" is minutes.
	Node	07	01	02	02	00	00	00	00	Relative Position	Relative positional information					
	Node	07	01	02	02	01	00	00	00	Local Datum Relative Position	The relative position of a local datum to another specified datum					
1	Leaf	07	01	02	02	01	01	00	00	Local Datum Relative Position Accuracy	The accuracy with which the measurement of relative position of the local datum is made	Floating Point	4 bytes			
	Node	07	01	02	02	02	00	00	00	Device Relative Position	The relative position of the essence-capturing device					
1	Leaf	07	01	02	02	02	01	00	00	Device Relative Positional Accuracy	Accuracy of frame center coordinates	Floating Point	4 bytes			
1	Leaf	07	01	02	02	02	02	00	00	Device Relative Position X	Defined by the X translational position of the camera from a local Datum Absolute Position. Positive values indicate translations in which the camera has physically moved from left to right. (default metres)	Floating Point	4 bytes			
1	Leaf	07	01	02	02	02	03	00	00	Device Relative Position Y	Defined by the Y translational position of the camera from a local Datum Absolute Position. Positive values indicate translations in which the camera has physically moved to a higher elevation. (default metres)	Floating Point	4 bytes			
1	Leaf	07	01	02	02	02	04	00	00	Device Relative Position Z	Defined by the Z translational position of the camera from a local Datum Absolute Position. Positive values shall indicate translations in which the camera has physically moved towards the target. (default metres)	Floating Point	4 bytes			
	Node	07	01	02	02	03	00	00	00	Subject Relative Position	The position of the subject depicted in the essence relative to another specified datum					
1	Leaf	07	01	02	02	03	01	00	00	Subject Relative Positional Accuracy	The accuracy with which the measurement of relative position of the subject is made. (default metres)	Floating Point	4 bytes			
	Node	07	01	02	03	00	00	00	00	Image Positional information	Positional information relating to a subset of the whole image					
1	Leaf	07	01	02	03	01	00	00	00	Position within viewport image x coordinate (pixels)	The position of a point (or object) within the viewed image expressed as x/y coordinates of the viewed image.	Int16	2 bytes			
1	Leaf	07	01	02	03	02	00	00	00	Position within viewport image y coordinate (pixels)	The position of a point (or object) within the viewed image expressed as x/y coordinates of the viewed image.	Int16	2 bytes			
1	Leaf	07	01	02	03	03	00	00	00	Source image centre x coordinate (pixels)	The x position of the centre of the captured (source) image expressed as x/y coordinates of the viewed image	Int16	2 bytes			
1	Leaf	07	01	02	03	04	00	00	00	Source image centre y coordinate (pixels)	The y position of the centre of the captured (source) image expressed as x/y coordinates of the viewed image	Int16	2 bytes			
1	Leaf	07	01	02	03	05	00	00	00	Viewport image centre x coordinate (pixels)	The x position of the centre of the viewed image expressed as x/y coordinates of the viewed image	Int16	2 bytes			
1	Leaf	07	01	02	03	06	00	00	00	Viewport image centre y coordinate (pixels)	The y position of the centre of the viewed image expressed as x/y coordinates of the viewed image	Int16	2 bytes			
	Node	07	01	03	00	00	00	00	00	Rate and Direction of Positional Change	Information about rate and direction of positional change					
	Node	07	01	03	01	00	00	00	00	Absolute Rate and Direction of Positional Change	Information about the absolute rate and direction of positional change					
	Node	07	01	03	01	01	00	00	00	Device Rate and Direction of Positional Change	Information about the absolute rate and direction of positional change of the capturing device					
1	Leaf	07	01	03	01	01	01	00	00	Device Absolute Speed	Defined by the relative speed of the sensor along the heading. Expressed in metres/second. Speed values shall indicate translations in which the capturing device has physically moved.	Floating Point	4 bytes			
1	Leaf	07	01	03	01	01	02	00	00	Device Absolute Heading	Defined by the absolute heading of the sensor. Expressed in degrees and tenths of degrees.	Floating Point	4 bytes			
	Node	07	01	03	01	02	00	00	00	Subject Rate and Direction of Positional Change	Information about the absolute rate and direction of positional change of the subject depicted in the captured essence					

Dictionary Version at introduction	Node or Leaf	SMPTE label (last 8 octets following Metadata Dictionary Universal Label)								Data Element Name	Data Element Definition	Type	Value Length	Value Range	Defining Document	Notes
1	Leaf	07	01	03	01	02	01	00	00	Subject Absolute Speed	Defined by the absolute speed of the subject along the heading, (default metres/second)	Floating Point	4 bytes			
1	Leaf	07	01	03	01	02	02	00	00	Subject Absolute Heading	Defined by the absolute heading of the subject. Expressed in degrees and tenths of degrees.	Floating Point	4 bytes			
	Node	07	01	03	02	00	00	00	00	Relative Rate and Direction of Positional Change	Information about the relative rate and direction of positional change					
	Node	07	01	03	02	01	00	00	00	Device Relative Rate and Direction of Positional Change	Information about relative rate and direction of positional change of the capturing device					
1	Leaf	07	01	03	02	01	01	00	00	Device Relative Speed	Defined by the relative speed of the sensor along the heading. Speed values shall indicate translations in which the camera has physically moved. (default metres/second)	Floating Point	4 bytes			
1	Leaf	07	01	03	02	01	02	00	00	Device Relative Heading	Defined by the relative heading of the sensor. Expressed in degrees and tenths of degrees.	Floating Point	4 bytes			
	Node	07	01	03	02	02	00	00	00	Subject Relative Rate and Direction of Positional Change	Relative information about rate and direction of positional change of the subject depicted in the captured essence					
1	Leaf	07	01	03	02	02	01	00	00	Subject Relative Speed	Defined by the relative speed of the subject along the heading, (default metres/second)	Floating Point	4 bytes			
1	Leaf	07	01	03	02	02	02	00	00	Subject Relative Heading	Defined by the relative heading of the subject. Expressed in degrees and tenths of degrees.	Floating Point	4 bytes			
	Node	07	01	08	00	00	00	00	00	Distance measurements	Length measurements relating to distance					
	Node	07	01	08	01	00	00	00	00	Device to Subject distance	Length measurements relating to distance between capturing device and the subject depicted in the captured essence					
1	Leaf	07	01	08	01	01	00	00	00	Slant Range	Distance from the sensor to the center point on ground of the framed subject (image) depicted in the captured essence, (default metres)	Floating point	4 bytes			
	Node	07	01	09	00	00	00	00	00	Dimensions	Length measurements relating to size					
	Node	07	01	09	01	00	00	00	00	Device Dimensions	Physical measurements relating to the size of the device used for the captured essence					
	Node	07	01	09	02	00	00	00	00	Subject Dimensions	Physical measurements relating to the size of the subject depicted in the captured essence					
1	Leaf	07	01	09	02	01	00	00	00	Target Width	Horizontal half width of the target frame image; used to compute the four corner points of the frame, (default metres)	Floating point	4 bytes			
	Node	07	01	09	03	00	00	00	00	Location Dimensions	Length measurements relating to the size of the location or studio in which the essence was captured					
	Node	07	01	09	04	00	00	00	00	Media Dimensions	Length measurements relating to the physical size of the image formed in a capturing device					
	Node	07	01	09	04	01	00	00	00	Image Dimensions	Length measurements relating to the physical size of the image formed in a capturing device					
	Node	07	01	09	04	01	01	00	00	Pan and scan image dimensions	Length measurements relating to pan and scan subsetting of a captured image					
1	Leaf	07	01	09	04	01	01	01	00	Viewport height	The height of the viewed area within a captured image (in pixels)	UInt16	2 bytes			
1	Leaf	07	01	09	04	01	01	02	00	Viewport width	The width of the viewed area within a captured image (in pixels)	UInt16	2 bytes			
	Node	07	01	10	00	00	00	00	00	Angular Specifications	Information regarding angles related to positioning information					
	Node	07	01	10	01	00	00	00	00	Device angles	Device information regarding angles related to positioning information					
1	Leaf	07	01	10	01	01	00	00	00	Sensor Roll Angle	Specifies the roll angle of the sensor. Expressed in degrees.	Floating point	4 bytes			
1	Leaf	07	01	10	01	02	00	00	00	Angle to North	Angle in degrees from the first row of the image to true north.	Floating point	4 bytes			
1	Leaf	07	01	10	01	03	00	00	00	Obliquity Angle	Obliquity angle of image expressed in degrees. The inverse of sensor depression angle.	Floating point	4 bytes			
	Node	07	01	10	02	00	00	00	00	Subject angles	Angles relating to the subject depicted in the captured essence					
	Node	07	01	20	00	00	00	00	00	Abstract Locations	Abstract information about position					
	Node	07	01	20	01	00	00	00	00	Place names	Place information					
	Node	07	01	20	01	01	00	00	00	Abstract names	Abstract place information					

Dictionary Version at introduction	Node or Leaf	SMPTE label (last 8 octets following Metadata Dictionary Universal Label)								Data Element Name	Data Element Definition	Type	Value Length	Value Range	Defining Document	Notes
1	Leaf	07	01	20	01	01	01	00	00	Place Keyword	The geographic name(s) of location(s) covered by a data set.	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
	Node	07	01	20	01	02	00	00	00	Country Codes	Country code information					
1	Leaf	07	01	20	01	02	01	00	00	Object Country Code	The code that represents the country depicted in the essence.	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	4 chars max		ISO/IEC 3166-1: 1997	
1	Leaf	07	01	20	01	02	02	00	00	Country code of shoot	Country where shooting took place	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	4 chars max		ISO/IEC 3166-1: 1998	
1	Leaf	07	01	20	01	02	03	00	00	Country code of Setting (Characterised Place)	The country code of the country where the depicted action is set in the production	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	4 chars max		ISO/IEC 3166-1: 1999	
1	Leaf	07	01	20	01	02	04	00	00	Country code of Copyright License	The country code of a country where copyright is licensed	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	4 chars max		ISO/IEC 3166-1: 2000	
1	Leaf	07	01	20	01	02	05	00	00	Country code of IP License	The country code of a country where IP rights are licensed	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	4 chars max		ISO/IEC 3166-1: 2001	
	Node	07	01	20	01	03	00	00	00	Regions	Information about Regions within a country					
1	Leaf	07	01	20	01	03	01	00	00	Region of Object	Region in a country where object is depicted	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
1	Leaf	07	01	20	01	03	02	00	00	Region of shoot	Region within a country where shooting took place	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
1	Leaf	07	01	20	01	03	03	00	00	Region of Setting (Characterised Place)	The region of the country where the depicted action is set in the production	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
1	Leaf	07	01	20	01	03	04	00	00	Region or area of Copyright License	The region of a country where copyright is licensed	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
1	Leaf	07	01	20	01	03	05	00	00	Region or area of IP License	The region of a country where IP rights are licensed	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
	Node	07	01	20	01	04	00	00	00	Addresses	Information about Addresses					
	Node	07	01	20	01	04	01	00	00	Postal Addresses	Information about Postal Addresses					
1	Leaf	07	01	20	01	04	01	01	00	Room Number	The room number of an address	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
1	Leaf	07	01	20	01	04	01	02	00	Street Number or Building name	An address line for the address.	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
1	Leaf	07	01	20	01	04	01	03	00	Street	An address line for the address.	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
1	Leaf	07	01	20	01	04	01	04	00	Postal Town	An address line for the address.	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
1	Leaf	07	01	20	01	04	01	05	00	City	The city of the address.	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
1	Leaf	07	01	20	01	04	01	06	00	State or Province or County	The state, province or county of the address.	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
1	Leaf	07	01	20	01	04	01	07	00	Postal Code	The ZIP or other postal code of the address.	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
1	Leaf	07	01	20	01	04	01	08	00	Country	The country of the address.	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
	Node	07	01	20	01	04	02	00	00	Setting Addresses (Characterised Place)	Information about address depicted in the setting of a production					
1	Leaf	07	01	20	01	04	02	01	00	Setting room number	The room number of a depicted address	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
1	Leaf	07	01	20	01	04	02	02	00	Setting Street Number or Building name	An address line for the depicted address	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
1	Leaf	07	01	20	01	04	02	03	00	Setting Street	An address line for the depicted address	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
1	Leaf	07	01	20	01	04	02	04	00	Setting Town	An address line for the depicted address	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
1	Leaf	07	01	20	01	04	02	05	00	Setting City	The city of the depicted address.	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
1	Leaf	07	01	20	01	04	02	06	00	Setting State or Province or County	The state, province or county of the depicted address.	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
1	Leaf	07	01	20	01	04	02	07	00	Setting Postal Code	The ZIP or other postal code of the depicted address.	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
1	Leaf	07	01	20	01	04	02	08	00	Setting Country	The country of the depicted address.	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
	Node	07	01	20	01	04	03	00	00	Electronic Address	Information about electronic addresses					
1	Leaf	07	01	20	01	10	03	01	00	Telephone number	Telephone number	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			

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1	Leaf	07	01	20	01	10	03	02	00	Fax number	Fax number	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
1	Leaf	07	01	20	01	10	03	03	00	e-mail address	e-mail address	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	127 bytes max			
	Node	07	01	20	02	00	00	00	00	Place descriptions	Place descriptions					
1	Leaf	07	01	20	02	01	00	00	00	Setting Description	eg. "A clearing in a wood" or "Falstaff's living room"	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	127 chars max			
	Node	07	02	00	00	00	00	00	00	Temporal	Information about temporal information					
	Node	07	02	01	00	00	00	00	00	Dates and Times	All information about dates and times					
	Node	07	02	01	01	00	00	00	00	General Dates and Times	General information about dates and times					
	Node	07	02	01	01	01	00	00	00	User defined Date-Time stamps	Time stamp application defined by user application					
1	Leaf	07	02	01	01	01	01	00	00	User defined Date-Time stamp - UTC	Time stamp application defined by user application	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
1	Leaf	07	02	01	01	01	02	00	00	User defined Date-Time stamp - Local Time	Time stamp application defined by user application	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
1	Leaf	07	02	01	01	01	03	00	00	User defined Date-Time stamp - SMPTE 309M	Time stamp application defined by user application	UI LSBF	8 bytes	Bitwise mapping of 64-bit timecode into 8 bytes, lsb first	SMPTE 309M & SMPTE 331M	The Field Flag / Phase bits and the Color Frame Flag bit shall be ignored. The Binary Group Flags and the Binary Groups shall be assumed to contain data as defined in SMPTE 309M.
1	Leaf	07	02	01	01	01	04	00	00	User defined Time stamp - SMPTE 12M	Time stamp application defined by user application	UI LSBF	8 bytes	Bitwise mapping of 64-bit timecode into 8 bytes, lsb first	SMPTE 12M & SMPTE 331M	The Binary Groups, the Binary Group Flags, the Field Flag / Phase bits and the Color Frame Flag bit shall be ignore
	Node	07	02	01	02	00	00	00	00	Absolute Dates and Times	Absolute date and time information					
	Node	07	02	01	02	01	00	00	00	Material Start True Date-Time (Date, Hours, minutes, seconds, fractions of seconds)	Absolute time at start of creating the segment, shot, clip, item etc.					
1	Leaf	07	02	01	02	01	01	00	00	Start Date Time - UTC	Absolute time at start of creating the segment, shot, clip, item etc.	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
1	Leaf	07	02	01	02	01	02	00	00	Start Date Time - Local Time (default = undefined)	Absolute time at start of creating the segment, shot, clip, item etc.	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
	Node	07	02	01	02	02	00	00	00	Material Start Time Address	Media time at start of segment, shot, clip, item etc.					
1	Leaf	07	02	01	02	02	01	00	00	Start (Date) Time - Timecodes	Media time at start of segment, shot, clip, item etc.	UI LSBF	8 bytes	Bitwise mapping of 64-bit timecode into 8 bytes, lsb first	SMPTE 12M & SMPTE 331M	The Binary Groups, the Binary Group Flags, the Field Flag / Phase bits and the Color Frame Flag bit shall be ignore
	Node	07	02	01	02	03	00	00	00	Material End True Date-Time (Date, Hours, minutes, seconds, fractions of seconds)	Absolute time at end of creating the segment, shot, clip, item etc.					
1	Leaf	07	02	01	02	03	01	00	00	End Date Time - UTC	Absolute time at end of creating the segment, shot, clip, item etc.	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
1	Leaf	07	02	01	02	03	02	00	00	End Date Time - Local Time (default = undefined)	Absolute time at end of creating the segment, shot, clip, item etc.	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
	Node	07	02	01	02	04	00	00	00	Material End Time Address	Media time at end of segment, shot, clip, item etc.					
1	Leaf	07	02	01	02	04	01	00	00	End (Date) Time - Timecodes	Media time at end of segment, shot, clip, item etc.	UI LSBF	8 bytes	Bitwise mapping of 64-bit timecode into 8 bytes, lsb first	SMPTE 12M & SMPTE 331M	The Binary Groups, the Binary Group Flags, the Field Flag / Phase bits and the Color Frame Flag bit shall be ignore
	Node	07	02	01	02	05	00	00	00	Material Occurrence True Date-Time (Date, Hours, minutes, seconds, fractions of seconds)	Absolute time of an occurrence to the segment, shot, clip, item etc.					
1	Leaf	07	02	01	02	05	01	00	00	Last Modification Date Time - UTC	Absolute time of the last modification of the segment, shot, clip, item etc.	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			

Dictionary Version at Introduction	Node or Leaf	SMPTE label (last 8 octets following Metadata Dictionary Universal Label)								Data Element Name	Data Element Definition	Type	Value Length	Value Range	Defining Document	Notes
1	Leaf	07	02	01	02	05	02	00	00	Last Modification Date Time - Local Time (default = undefined)	Absolute time of the last modification of the segment, shot, clip, item etc.	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
	Node	07	02	01	02	06	00	00	00	Material Occurrence Time Address	Media time of the last modification of the segment, shot, clip, item etc.					
1	Leaf	07	02	01	02	06	01	00	00	Last Modification Date Time - Timecodes	Media time of the last modification of the segment, shot, clip, item etc.	UI/LSBF	8 bytes	Bitwise mapping of 64-bit timecode into 8 bytes, lsb first	SMPTE 309M & SMPTE 331M	The Field Flag / Phase bits and the Color Frame Flag bit shall be ignored. The Binary Group Flags and the Binary Groups shall be assumed to contain data as defined in SMPTE 309M.
	Node	07	02	01	02	07	00	00	00	Event Start True Date-Time (Date, Hours, minutes, seconds, fractions of seconds)	The absolute beginning date and time of the project, mission, scene, editing event, license, publication etc.					
1	Leaf	07	02	01	02	07	01	00	00	Event Start Date and Time - UTC	The absolute beginning date and time of the project, mission, scene, editing event, license, publication etc.	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
1	Leaf	07	02	01	02	07	02	00	00	Event Start Date and Time - Local Time (default = undefined)	The absolute beginning date and time of the project, mission, scene, editing event, license, publication etc.	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
	Node	07	02	01	02	08	00	00	00	Event Start Time Address	The absolute beginning date and time of the project, mission, scene, editing event, license, publication etc.					
1	Leaf	07	02	01	02	08	01	00	00	Event Start (Date) and Time - Timecodes	The absolute beginning date and time of the project, mission, scene, editing event, license, publication etc.	UI/LSBF	8 bytes	Bitwise mapping of 64-bit timecode into 8 bytes, lsb first	SMPTE 309M & SMPTE 331M	The Field Flag / Phase bits and the Color Frame Flag bit shall be ignored. The Binary Group Flags and the Binary Groups shall be assumed to contain data as defined in SMPTE 309M.
	Node	07	02	01	02	09	00	00	00	Event End True Date-Time (Date, Hours, minutes, seconds, fractions of seconds)	The absolute ending date and time of the project, mission, scene, editing event, license, publication etc.					
1	Leaf	07	02	01	02	09	01	00	00	Event End Date and Time - UTC	The absolute ending date and time of the project, mission, scene, editing event, license, publication etc.	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
1	Leaf	07	02	01	02	09	02	00	00	Event End Date and Time - Local Time (default = undefined)	The absolute ending date and time of the project, mission, scene, editing event, license, publication etc.	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
	Node	07	02	01	02	0A	00	00	00	Event End Time Address	The absolute ending date and time of the project, mission, scene, editing event, license, publication etc.					
1	Leaf	07	02	01	02	0A	01	00	00	Event End (Date and) Time - Timecodes	The absolute ending date and time of the project, mission, scene, editing event, license, publication etc.	UI/LSBF	8 bytes	Bitwise mapping of 64-bit timecode into 8 bytes, lsb first	SMPTE 309M & SMPTE 331M	The Field Flag / Phase bits and the Color Frame Flag bit shall be ignored. The Binary Group Flags and the Binary Groups shall be assumed to contain data as defined in SMPTE 309M.
	Node	07	02	01	03	00	00	00	00	Relative Times	Relative time information					
	Node	07	02	01	03	01	00	00	00	Material Start Relative Times	The relative start time of the segment, shot, clip, item etc.					
1	Leaf	07	02	01	03	01	01	00	00	Start time relative to reference (Date, Hours, minutes, seconds, fractions of seconds)	The relative start time of the segment, shot, clip, item etc.	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
1	Leaf	07	02	01	03	01	02	00	00	Start timecode relative to reference	The relative start time of the segment, shot, clip, item etc.	UI/LSBF	8 bytes	Bitwise mapping of 64-bit timecode into 8 bytes, lsb first	SMPTE 12M & SMPTE 331M	The Binary Groups, the Binary Group Flags, the Field Flag / Phase bits and the Color Frame Flag bit shall be ignore
	Node	07	02	01	03	02	00	00	00	Material End Relative Times	The relative end time of the segment, shot, clip, item etc.					
1	Leaf	07	02	01	03	02	01	00	00	End time relative to reference (Date, Hours, minutes, seconds, fractions of seconds)	The relative end time of the segment, shot, clip, item etc.	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
1	Leaf	07	02	01	03	02	02	00	00	End timecode relative to reference	The relative end time of the segment, shot, clip, item etc.	UI/LSBF	8 bytes	Bitwise mapping of 64-bit timecode into 8 bytes, lsb first	SMPTE 12M & SMPTE 331M	The Binary Groups, the Binary Group Flags, the Field Flag / Phase bits and the Color Frame Flag bit shall be ignore
	Node	07	02	01	03	03	00	00	00	Event Start Relative Times	The relative start time of the project, mission, scene, editing event, license, publication etc.					
1	Leaf	07	02	01	03	03	01	00	00	Event start time relative to reference (Date, Hours, minutes, seconds, fractions of seconds)	The relative start time of the project, mission, scene, editing event, license, publication etc.	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
1	Leaf	07	02	01	03	03	02	00	00	Event start timecode relative to reference	The relative start time of the project, mission, scene, editing event, license, publication etc.	UI/LSBF	8 bytes	Bitwise mapping of 64-bit timecode into 8 bytes, lsb first	SMPTE 12M & SMPTE 331M	The Binary Groups, the Binary Group Flags, the Field Flag / Phase bits and the Color Frame Flag bit shall be ignore

Dictionary Version at Introduction	Node or Leaf	SMPTE label (last 8 octets following Metadata Dictionary Universal Label)								Data Element Name	Data Element Definition	Type	Value Length	Value Range	Defining Document	Notes
	Node	07	02	01	03	04	00	00	00	Event End Relative Times	The relative end time of the project, mission, scene, editing event, license, publication etc					
1	Leaf	07	02	01	03	04	01	00	00	Event end time relative to reference (Date, Hours, minutes, seconds, fractions of seconds)	The relative end time of the project, mission, scene, editing event, license, publication etc	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
1	Leaf	07	02	01	03	04	02	00	00	Event end timecode relative to reference	The relative end time of the project, mission, scene, editing event, license, publication etc	UI/LSBF	8 bytes	Bitwise mapping of 64-bit timecode into 8 bytes, lsb first	SMPTE 12M & SMPTE 331M	The Binary Groups, the Binary Group Flags, the Field Flag / Phase bits and the Color Frame Flag bit shall be ignore
	Node	07	02	01	03	10	00	00	00	Offsets	Information about offset times					
	Node	07	02	01	03	10	01	00	00	Material offsets	Information about material offset timing					
1	Leaf	07	02	01	03	10	01	01	00	Frame Count Offset	Offset of the content from a given timecode in timecode frames.	UInt 32				
	Node	07	02	01	08	00	00	00	00	Setting Date and Time (Characterised Time Period)	Time period(s) characterized by the data set.					
1	Leaf	07	02	01	08	01	00	00	00	Time period Keyword	The name of a time period covered by a data set. Eg Cretaceous	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
	Node	07	02	01	10	00	00	00	00	Process Date and time	Date and Time information relating to Process					
	Node	07	02	01	10	01	00	00	00	Creation Date & Time	Identifies date and time at the point of creation.					
1	Leaf	07	02	01	10	01	01	00	00	Creation Date & Time - Local Time (default = undefined)	Identifies date and time at the point of creation.	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
1	Leaf	07	02	01	10	01	02	00	00	Creation (Date and) Time - Timecodes	Identifies date and time at the point of creation.	UI/LSBF	8 bytes	Bitwise mapping of 64-bit timecode into 8 bytes, lsb first	SMPTE 309M & SMPTE 331M	The Field Flag / Phase bits and the Color Frame Flag bit shall be ignored. The Binary Group Flags and the Binary Groups shall be assumed to contain data as defined in SMPTE 309M.
	Node	07	02	01	10	02	00	00	00	Modification Date & Time	Identifies date and time at the point of modification					
1	Leaf	07	02	01	10	02	01	00	00	Modification Date & Time - Local Time (default = undefined)	Identifies date and time at the point of modification	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
1	Leaf	07	02	01	10	02	02	00	00	Modification (Date and) Time - Timecodes	Identifies date and time at the point of modification	UI/LSBF	8 bytes	Bitwise mapping of 64-bit timecode into 8 bytes, lsb first	SMPTE 309M & SMPTE 331M	The Field Flag / Phase bits and the Color Frame Flag bit shall be ignored. The Binary Group Flags and the Binary Groups shall be assumed to contain data as defined in SMPTE 309M.
	Node	07	02	02	00	00	00	00	00	Durations	Information about time durations					
	Node	07	02	02	01	00	00	00	00	Absolute Durations	Absolute time duration information					
	Node	07	02	02	01	01	00	00	00	Edit Timeline Durations	Time duration information					
1	Leaf	07	02	02	01	01	01	00	00	Frame Count	Length of the segment, shot, clip, item etc in frames.	UInt 32	4 bytes			
	Node	07	02	02	01	02	00	00	00	Material Absolute Duration	The absolute duration of the segment, shot, clip, item etc.					
1	Leaf	07	02	02	01	02	01	00	00	Material Absolute Duration (Days, Hours, minutes, seconds, fractions of seconds)	The absolute duration of the segment, shot, clip, item etc.	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			
1	Leaf	07	02	02	01	02	02	00	00	Time Duration - Timecodes	The absolute duration of the segment, shot, clip, item etc.	UI/LSBF	8 bytes	Bitwise mapping of 64-bit timecode into 8 bytes, lsb first	SMPTE 12M & SMPTE 331M	The Binary Groups, the Binary Group Flags, the Field Flag / Phase bits and the Color Frame Flag bit shall be ignore
1	Leaf	07	02	02	01	02	03	00	00	Textless black duration	eg. 1 minutes after end of programme	UInt 32	4 bytes			
	Node	07	02	02	01	03	00	00	00	Event Absolute Durations	The absolute duration of the project, mission, scene, editing event, license, publication etc					
1	Leaf	07	02	02	01	03	01	00	00	Event Absolute Duration Frame Count	The absolute duration of the project, mission, scene, editing event, license, publication etc	UInt 32	4 bytes			
1	Leaf	07	02	02	01	03	02	00	00	Event Absolute Time Duration (Days, Hours, minutes, seconds, fractions of seconds)	The absolute duration of the project, mission, scene, editing event, license, publication etc	ISO/IEC 646:1991 - ISO 7-Bit Coded Character Set	32 bytes max			

[illegible]

PROPOSED SMPTE STANDARD

SMPTE 336M

for Television — Data Encoding Protocol using Key-Length-Value

Page 1 of 25 pages

1 Scope

This standard defines an octet-level data encoding protocol for representing data items and data groups. This protocol defines a data structure which is independent of the application or transportation method used.

The standard defines a key-length-value (KLV) triplet as a data interchange protocol for data items where the key identifies the data, the length specifies the length of the data, and the value is the data itself. The KLV protocol provides a common interchange point for all compliant applications irrespective of the method of implementation or transport.

The standard also provides methods for combining associated KLV triplets in data sets where the set of KLV triplets is itself coded with KLV data coding protocol. Such sets can be coded in either full form (universal sets) or in one of four increasingly bit-efficient forms (global sets, local sets, variable-length packs, and fixed-length packs). The standard provides a definition of each of these data constructs.

The encoding octet range (length of the payload) specified in this standard may generate unusually large volumes of data. Consequently, a specific application of KLV encoding may require only a limited operating data range and those details shall be defined in a relevant application document.

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

ISO/IEC 8825-1:1998 (ITU-T X.690), Information Technology — ASN.1 Encoding Rules — Specification of Basic Encoding Rules (BER), Canonical Encoding Rules (CER), and Distinguished Encoding Rules (DER)

3 Key-length-value (KLV) protocol

Table 1 and figure 1 present an introductory view of the key-length-value (KLV) protocol for encoding data. The data encoded may be a single data item or a data group. The coding of data items is described in clause 4 while the coding of data groups is described in clause 5 of this standard.

The KLV coding protocol is composed of a universal label (UL) identification key (UL key), followed by a numeric length (value length), followed by the data value.

The composition of the UL key is described in 3.1 of this standard. The length of the full UL key shall be 16 octets. The length field is described in 3.2 of this standard. The octet length of the length field varies as defined in 3.2 of this standard. The value is described in 3.3 of this standard. The value is a sequence of octets of the data type as specified in a relevant standard and is not further encoded by the KLV protocol. The length of the value field is variable and any limitations are defined in a relevant defining standard.

Table 1 – Key-length-value (KLV) fields for encoding of data

Field	Description	Length	Content/Format
UL key	Universal label for identification of the value	16 octets	Clause 3.1
Length	Length of the value field	Defined in a relevant dictionary, essence, application standard, but variable length	Clause 3.2
Value	Value associated with the UL key	Variable	Clause 3.3

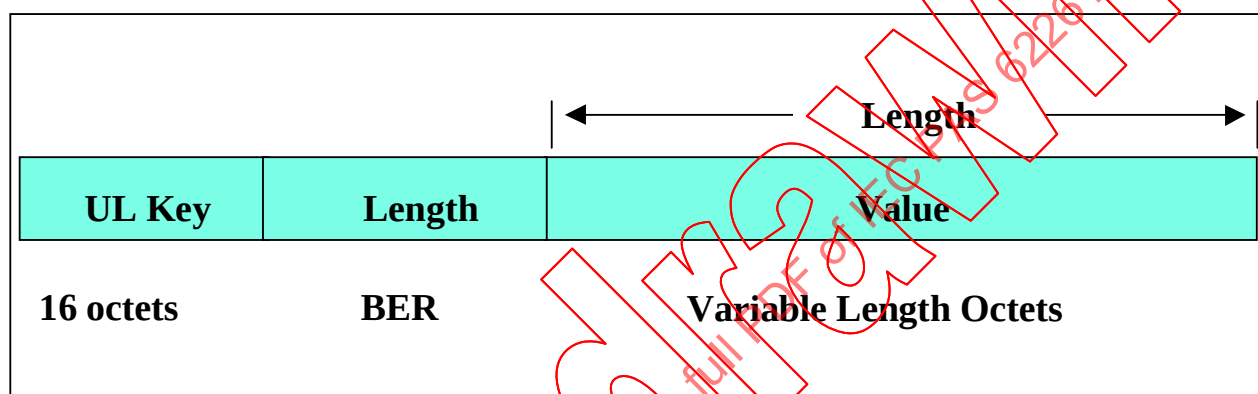


Figure 1 – Key-length-value (KLV) encoding

The bit-order (lsb or msb first) for KLV encoding shall be that of the transport used to carry the information.

3.1 ANSI/SMPTE 298M universal label key

KLV coding protocol shall use a 16-word universal label (UL) according to SMPTE 298M as the UL key to identify the data in the value field.

Each word in the SMPTE 298M UL is coded using the basic encoding rules (BER) for the encoding of an object identifier value specified in ISO/IEC 8825-1, paragraph 8.19. Each word of the UL key shall be limited to the range 0x00 to 0x7f and can be represented by a single octet. The UL key shall have left-to-right significance with the first octet as the most significant. The leftmost octet of value 0000 in the UL key shall define the termination of the label and all octets of lower significance shall also be set to 0000. Octets of value

0x00 shall have no significance to the meaning of the UL key.

The full UL key shall consist of a 16-octet field including an object ID (OID) and the UL size (0x0e indicating a total UL key size of 16 octets) followed by a UL code and a series of subidentifiers which shall define the UL designators. The first two UL designators shall have reserved values for the KLV coding protocol according to this standard.

NOTE – The SMPTE UL itself adopts KLV coding with the object ID as the key and the UL size as the length and the UL designators and data element tag as the value.

When applying the SMPTE UL to the coding of data according to this standard, these fields shall be categorized as the UL header, UL designators, and item designator as shown in table 2.

Table 2 – Field descriptions for the universal label key for the KLV encoding of data

No.	Field	Description	Length	Content/Format
1	UL header:			
1	OID	Object identifier	1 octet	Always 0x06
2	UL size	16-octet size of the UL	1 octet	Always 0x0E
3	UL designators:			
3	UL code	Concatenated subidentifiers ISO, ORG	1 octet	Always 0x2B
4	SMPTE designator	SMPTE subidentifier	1 octet	Always 0x34
5	Registry category designator	Registry category designator identifying the category of registry described (e.g., dictionaries)	1 octet	See table 3
6	Registry designator	Registry designator identifying the specific registry in a category (e.g., metadata dictionary)	1 octet	See table 3
7	Structure designator	Designator of the structure variant within the given registry	1 octet	Clause 3.1.2
8	Version number	Version of the given registry which first defines the item specified by the item designator	1 octet	Incrementing number
9-16	Item designator	Unique identification of the particular item within the context of the UL designator	8 octets	See relevant standard and version

Annex C shows an informative example of a metadata UL key from the SMPTE metadata dictionary in tabular and figure formats.

Note that decoders which recognize the UL key but do not want to, or cannot, decode the associated value may ignore the item and shall continue the decoding process of subsequent items using the length value to skip the value of the undecoded item. If decoders store or forward the item, they shall forward the item unaltered.

3.1.1 UL designators

Table 3 defines octet values for the designators to be used in octets 5 through 7 of the UL designators. SMPTE standards and recommended practices which define a UL key with the value of octet 5 (registry category designator) in the range 0x01 to 0x03 shall register the full UL key or keys used with the SMPTE Registration Authority in the registry identified by octets 6 and 7 (registry designator and structure designator).

3.1.1.1 Dictionaries

SMPTE standards and recommended practices which define the value of word 5 of the UL key as 0x01

are dictionary standards and shall be used to define single data items with the KLV data construct.

The coding of individual items is defined in clause 4.

3.1.1.2 Sets and packs

SMPTE standards and recommended practices which define the value of word 5 of the UL key as 0x02 are set and pack standards and shall be used to define groups of KLV coded data items.

The coding of data groups is defined in clause 5.

3.1.1.3 Wrappers and containers

SMPTE standards and recommended practices which define the value of word 5 of the UL key as 0x03 are wrapper and container standards and use the UL key to identify the wrapper or container and its contents. Wrappers and containers differ from sets and packs in that they do not necessarily employ an overall KLV data construct for the entire contents of the wrapper or container. It is recommended that individual parts of a wrapper or container encode data using the KLV coding protocol, but these parts may be bound together by other techniques. In some cases, a wrapper or container may employ an overall KLV

Table 3 – UL designators for octets 5 through 7

Registry category Octet 5	Registry Octet 6	Structure Octet 7	Described in
01 – Dictionaries	01 – Metadata dictionaries	0x01-0x7f – Structure designator	Clause 4
	02 – Essence dictionaries	0x01-0x7f – Structure designator	Other standard/practice
	03 – Control dictionaries	0x01-0x7f – Structure designator	Other standard/practice
	04 – Types dictionaries	0x01-0x7f – Structure designator	Other standard/practice
02 – Groups (sets and packs)	01 – Universal sets	0x01-0x7f – Structure designator	Clause 5
	02 – Global sets (default)	0x01-0x7f – Structure designator	Clause 5.1
	03 – Local sets (default)	0x01-0x7f – Structure designator	Clause 5.2
	04 – Variable-length packs (default)	0x01-0x7f – Structure designator	Clause 5.3
	05 – Fixed-length packs	0x01-0x7f – Structure designator	Clause 5.4
03 – Wrappers and containers	01 – Simple wrappers	0x01-0x7f – Structure designator	Clause 5.5
	02 – Complex wrappers	0x01-0x7f – Structure designator	Other standard/practice
04 – Labels	01 – Labels dictionary	0x01-0x7f – Structure designator	Other standard/practice

construct in certain applications (such as a streaming interface) but employ another technique in other applications (such as a storage container). In these cases, the wrapper or container is not redefined as a set or a pack but retains the definition as a container or wrapper for consistency of identification.

Simple wrappers and containers are defined as embedding all the data into a single framework with no external references.

Complex containers and wrappers are defined by frameworks where individual data items may be included in a file by reference rather than embedding. Complex containers and wrappers can be more efficient and are suited to local environments where references can be easily resolved.

The definition of wrappers and containers is outside the scope of this standard and can be found in other documents.

3.1.2 Structure designator

Octet 7 shall contain the structure designator for the given registry.

Structure designators are allocated to distinguish between incompatible versions of the same registry. They may be thought of as a major version number.

NOTE – Different structure designators may be assigned when a registry becomes so cluttered that it has outlived its usefulness, or when changes to the contents, structure, or class relationships of the registry are necessary which prevent backward compatibility.

Different structure designators may also be assigned to distinguish between different syntax rules for construction and interpretation of values.

Different structure designators may also be assigned when more than one standard or practice is used to define the contents of a specific registry.

The precise discipline for allocation of structure designators is described for each specific registry in the clauses below.

3.1.3 Version number

Octet 8 shall contain the version number of the given registry which first defines the item specified by the item designator.

New items may be added to registries after initial approval of the controlling standard or practice. Each time a set of item definitions is added, the current version number of the particular registry is incremented. Each entry in a registry includes the version number in which the item was first defined. It is this number which is carried in octet 8.

Parsers may use the version number as an additional guide and consistency check in the process of parsing a UL key.

3.1.4 Item designator

Octets 9 through 16 of the UL key comprise the item designator.

The item designator field is fixed 8 octets in length. Item designators are from 1 to 8 bytes long, and are padded on the right with zero octets to fill the 8-byte field. ASN.1 object identifier coding is used to provide for allocation of varying quantities of subidentifiers in a hierarchical manner.

The precise meaning and construction of the item designator depends upon the specific registry and structure variant, and is described further in the clause below.

3.2 Encoding of the KLV length field

In the KLV coding protocol, the value of the length field shall be encoded using the basic encoding rules (BER) for either the short form or long form encoding of length octets specified in ISO/IEC 8825-1, paragraph 8.1.3. This method of value length encoding is self-contained and allows for efficient parsing of KLV encoded data. When the KLV coding protocol is applied to groups of KLV coded units, the length field for individual units may adopt a different method as defined by the standard for the coding of that group (see clause 5).

3.2.1 BER short-form length encoding

The following normative section (including example) is quoted from ISO/IEC 8825-1:

8.1.3.4 In the short form, the length octets shall consist of a single octet in which bit 8 is zero and bits 7 to 1 encode the number of octets in the contents [value] octets (which may be zero), as an unsigned binary integer with bit 7 as the most significant bit.

Example: L = 38 can be encoded as 00100110₂.

The short form for length encoding shall be used whenever the data value length is less than 128 octets.

3.2.2 BER long-form length encoding

The following normative section (including example) is quoted from ISO/IEC 8825-1:

8.1.3.5 In the long form, the length octets shall consist of an initial octet and one or more subsequent octets. The initial octet shall be encoded as follows:

- a) bit 8 shall be one;
- b) bits 7 to 1 shall encode the number of subsequent octets in the length octets, as an unsigned binary integer with bit 7 as the most significant bit;
- c) the value 1111111₂ shall not be used.

NOTE – This restriction is introduced for possible future extensions.

Bits 8 to 1 of the first subsequent octet, followed by bits 8 to 1 of the second subsequent octet, followed in turn by bits 8 to 1 of each further octet up to and including the last subsequent octet, shall be the encoding of an unsigned binary integer equal to the number of octets in the value field, with bit 8 of the first subsequent octet as the most significant bit.

NOTE – This is sometimes known as big-endian byte order.

Example:

L = 201 can be encoded as:

Octet 1 = 10000001₂ Octet 2 = 11001001₂ [b8 ... b1]

NOTES

1 While there are no restrictions in this standard on the maximum number of octets in the data value length field, the presence of large data value lengths can be determined from the first octet in the BER long-form length encoding.

2 It is required that the short form of BER be used for all values smaller than or equal to 127 (0x7f).

Where appropriate, individual application standards and recommended practices may define the maximum octet length of the length field or may place limitations on the value range of the length field in order to simplify decoder requirements.

Implementations shall make every effort to apply a valid value to the length field. However, in certain operations, it may prove impractical to establish the length of the value field. Such a case is an incoming data stream which is assigned a key and a length field at the start point. In this case, the value of the length cannot be established until the termination of the stream and at that point, it may prove impossible to return to the length field to enter the value. In such cases, the length field shall be set to [0x80] which shall indicate a nondeterministic length of the value field. Any application document which allows the length of the value field to be undefined must define an alternative method of locating the end of the value field.

NOTE – The length value [0x80] is used because it is normally meaningless as a BER long-form value as it indicates zero subsequent octets.

3.3 Encoding of data values

Data values may be either individual data items or data groups. In either case, the data is an octet string whose length is specified by the length value. The last octet of the value shall be the terminating octet of the data sequence.

3.4 Empty metadata items

Specifications for contiguity of KLV packets including any gaps between KLV packets are outside the scope of this standard, and are addressed in the appropriate transport layer documents.

However, should applications so require it, breaks in the data sequence can be inserted by the use of a

specific empty metadata item. Use of empty metadata items is not mandatory.

The empty metadata item is a KLV coded packet which shall define a length value followed by an empty value field. No attempt should be made to interpret the data in the value field.

The empty metadata item shall be defined in the metadata dictionary.

Empty metadata items may be coded as individual items or within sets, when allowed by the specific set definition.

Applications may delete or skip any or all empty metadata items upon receipt. Applications may insert empty metadata items, but shall not require other applications to preserve such items.

4 KLV coding of individual data items

The KLV coding of individual data items is a simple application of the key, length, and value as defined in clause 3.

The UL key of individual data items is defined in a dictionary together with the ranges of length and the specification of the value itself. For individual data items, the value of word 5 of the UL key shall be 0x01.

4.1 Identification of value data representations

The value of many dictionary items can be represented in more than one way. For example, a start time in the metadata dictionary can be represented as a character string of the time code or as an efficient bit-packed form. The first offers direct mapping to a display whereas the second offers high-transmission efficiency for use in narrow-band data channels. There are many such dictionary items which have multiple data representations for the same descriptor.

Where a dictionary item has more than one data representation for the value, one representation shall be designated as the default representation and shall be assigned a key with at least one trailing zero octet. Alternate representations shall be assigned keys by replacing the leftmost trailing zero octet with nonzero values, which shall be assigned sequentially. Each representation shall be documented in the dictionary.

Example:

01.02.03.04.00.00.00.00 is name (default data representation in 16-bit unicode characters);

01.02.03.04.01.00.00.00 is name (different data representation in ISO 7-bit characters);

01.02.03.04.02.00.00.00 is name (another data representation in 32-bit unicode characters).

The parser treats all representations as the same item; i.e., it recognizes 01.02.03.04.00, then looks for xx in place of the 00 to identify different encodings. Since the default representation is defined, the extra non-zero term in the fifth position is known to be a new data representation of the default dictionary item and not a new dictionary entry.

Many dictionary values share a common set of definitions for multiple data representations. To simplify the dictionary definitions, a types dictionary shall be used to define these data representations. The types dictionary shall be used as a shared resource for all other dictionaries.

Annex D shows an example of KLV coding for a single metadata item.

5 KLV group coding

Group coding of data elements can be used to reduce the overhead of repeating redundant information that appears in the key of each unit. Group coding also allows logical groups of individual data elements, or groups of elements, to be encoded together and provides options for increased bit-frequency. In order of increasing coding efficiency, the KLV coding protocol can be used to support universal sets, global sets, local sets, variable-length packs, and fixed-length packs described as follows:

- *Universal sets* shall be used to construct a logical grouping of data elements and other KLV encoded items. Universal sets use the full KLV coding construct throughout.
- *Global sets* are defined as per universal sets, but offer coding efficiency by sharing a common key header. This coding gain is lossless and every UL key can be fully recovered from the data in the global set alone.

- *Local sets* are defined as per universal sets, but offer coding efficiency through the use of short local tags whose meaning is defined only within the context of the local set. Local sets retain the KLV data construct, but require a separate standard or recommended practice to define the meaning of the local tags and to provide a map from the local tag value to the UL key value.

- *Variable-length packs* are defined as a further grouping of data elements that eliminates the use of UL keys and local tags for all individual elements within the group. Variable-length packs, therefore, rely on a standard or recommended practice which defines the order of data elements within the pack.

- *Fixed-length packs* are the most efficient (and least flexible) grouping of data elements that eliminates the use of both UL keys and local tags and removes the length for all individual elements within the group. Thus, fixed-length packs rely on a standard or recommended practice which defines both the order of data elements and the length of each data element within the pack.

Sets and packs shall consist of a number of individual data elements which are coded as a group by the KLV set or pack data construct. The set or pack shall be defined by a full UL key whose value shall be registered with the SMPTE Registration Authority. A set may encode data elements which are themselves sets or packs as well as individual dictionary items. This is called KLV recursive coding and this standard provides no limit on the number of levels of recursion which may be used by any particular application. A pack shall only encode a group of individual dictionary items; i.e., packs shall not use recursive coding.

The presence of sets or packs shall be indicated by 0x02 in the registry category designator field (octet 5) of the set or pack UL key. The registry designator field (octet 6) shall be used to identify the type of set or pack. The set or pack standard or practice and registry shall be identified by the structure designator field (octet 7) and the version of the registry shall be identified by the version number field (octet 8).

The length of a set or pack shall be encoded as either ASN.1 short-form or long-form coding. Application standards or recommended practices may provide an upper bound to the value of the ASN.1 coded length to ease decoder requirements.

Application standards or recommended practices may also provide a fixed-length coding scheme specific to the application for sets or packs embedded within sets or packs. However, this is discouraged.

The set or pack value shall be comprised of a number of individual data elements with coding as defined by the set or pack type.

The following clauses define how the data elements are encoded for universal sets, global sets, local sets, variable-length packs, and fixed-length packs.

5.1 Universal sets

The UL key of a universal set shall be defined by an accompanying standard or recommended practice including a structure designator and an accompanying universal set registry including a version number.

The UL key of a universal set shall be 16 octets in length.

The length of a universal set shall be coded as per ASN.1 notation; long or short form as required.

The value of a universal set shall be a sequence of KLV-encoded elements whose total length is given by the length field. Each and every data element in a universal set shall apply KLV data coding protocol including the full UL key value.

Relevant application standards or practices may specify constraints upon the value of a universal set such as the number and size of items, the allowed sequence of items, and whether any items are mandatory or optional.

The UL key for universal sets is described in table 4. Figure 2 illustrates the data structure for the encoding of universal sets.

5.2 Global sets

The UL key of a global set shall be defined by an accompanying standard or recommended practice including a structure designator and an accompanying global set registry including a version number.

The UL key of a global set shall be 16 octets in length.

The length of a global set shall be coded as per ASN.1 notation; long or short form as required.

The value of a global set shall be a sequence of KLV-encoded elements whose total length is given by the length field. Each and every data element in a global set shall apply KLV data coding protocol, but with a shortened global tag value replacing the UL key as described next.

The global set UL shall be defined in two parts:

- The first group of 8 octets (UL header and UL designator) shall be registered with the SMPTE Registration Authority and shall be used to identify the global set standard or recommended practice including the structure designator. Each entry in the global set registry shall record the version number in which it was first defined.

- The second group of 8 octets is called the global set designator and shall be used to define the common UL header and UL designator for all the UL keys within the global set. This second group of 8 octets shall include the UL header fields together with as much of the UL designator as is common to all items in the global set. The global set designator may be terminated by a zero-value octet to indicate termination of the common UL designator root. The significant length of the second group to the zero value terminator shall be 2 to 8 octets. If the length of the second group is 8 octets, then the zero-value terminator octet is not required.

Each global tag is from 2 to 12 words in length. Global tags of length less than 12 words shall be terminated by a single zero value thus removing redundant UL data.

The full 16-octet UL key of each item in the global set can be losslessly recreated by concatenating the nonzero octets of the global set designator and the global tag of the item. If the resulting concatenation is less than 16 octets in length, the remaining octets in the 16-octet space shall be zero filled.

Relevant application standards or recommended practices may specify constraints upon the value of a global set such as the number and size of items, the allowed sequence of items, and whether any items are mandatory or optional.

The UL key for global sets is described in table 5.

Figure 3 illustrates the structure for the encoding of global data sets.

Table 4 – Field descriptions for the UL key for the KLV encoding of universal sets

No.	Field	Description	Length	Content/Format
1	UL header:			
1	OID	Object identifier	1 octet	Always 0x06
2	UL size	16-octet size of the UL	1 octet	Always 0x0E
3	UL designators:			
3	UL code	Concatenation of subidentifiers ISO, ORG	1 octet	Always 0x2B
4	SMPTE designator	SMPTE subidentifier	1 octet	Always 0x34
5	Registry category designator	Sets and packs	1 octet	Always 0x02
6	Registry designator	Universal sets	1 octet	Always 0x01
7	Structure designator	Designator of the structure variant within the universal set registry	1 octet	Incrementing number
8	Version number	Version of the given registry which first defines the item specified by the item designator	1 octet	Incrementing number
9-16	Universal set designator	Unique identification of the particular universal set	8 octets	See universal set registry

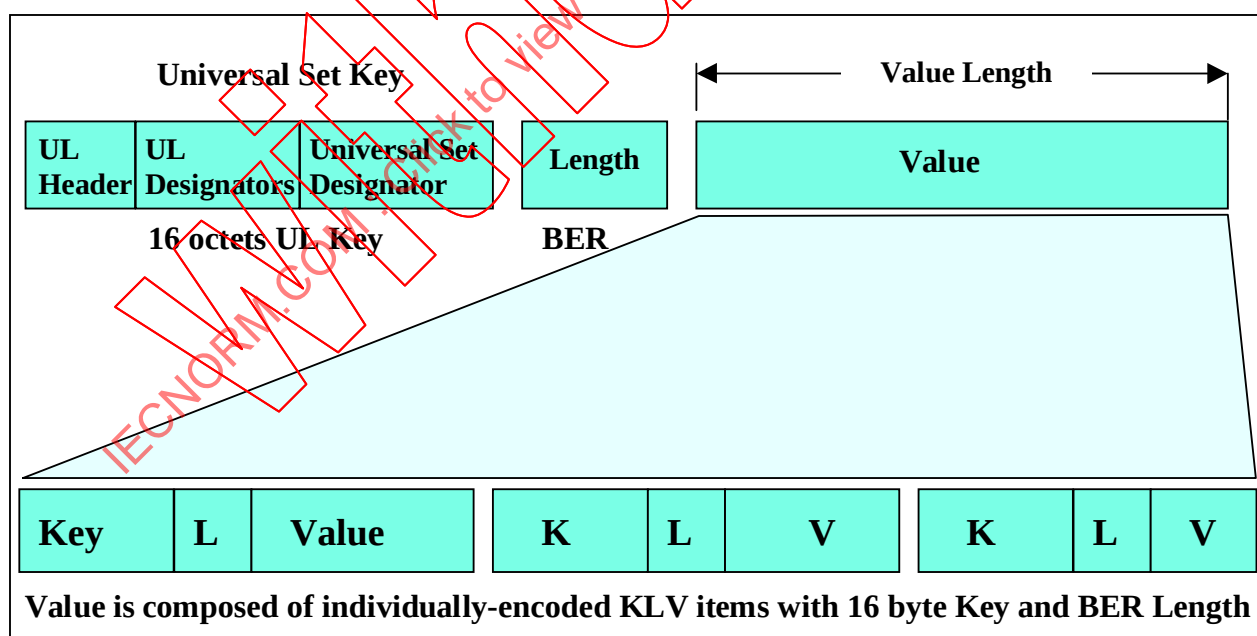


Figure 2 – KLV coded universal set data structure

Table 5 – Field descriptions for the UL key for global set encoding

No.	Field	Description	Length	Content/Format
1	UL header:			
1	OID	Object identifier	1 octet	Always 0x06
2	UL size	16-octet size of the UL	1 octet	Always 0x0E
3	UL designators:			
3	UL code	Concatenation of subidentifiers ISO, ORG	1 octet	Always 0x2B
4	SMPTE designator	SMPTE designator	1 octet	Always 0x34
5	Registry category designator	Sets and packs	1 octet	Always 0x02
6	Registry designator	Global sets	1 octet	See table 6
7	Structure designator	Designator of the structure variant within the global set registry	1 octet	See the accompanying standard or practice
8	Version number	Version of the global set registry which first defines the item specified by the global set designator	1 octet	Incrementing number
9-16	Global set designator:			
	Global set designator	The common portion of the UL key shared by all global tags	8 octets	Active number defines the octets needed to establish the common root for all global tags (2-8 octets)

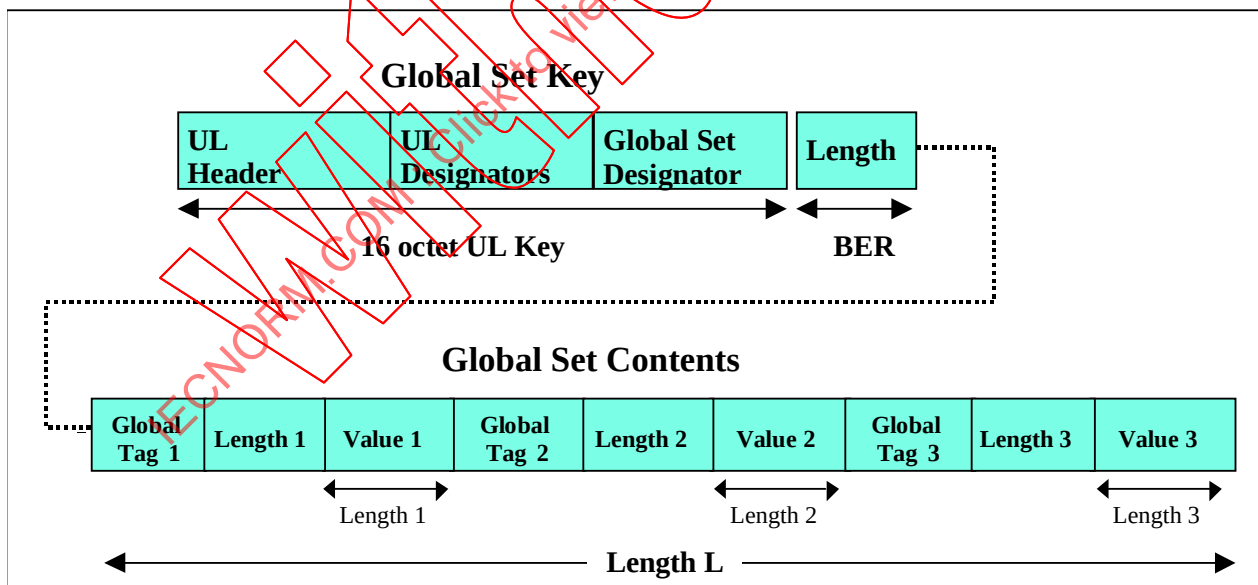


Figure 3 – KLV coded global set data structure

The 16-octet global set UL key is followed by the global set length (encoded using ASN.1 BER length encoding) which is followed by a number of elements which shall each be triplets of global tag, length, and value.

The preferred specification of the length fields of individual elements is ASN.1 BER short- or long-form encoding. The full range of allowed length field lengths is defined by the registry designator, according to table 6. All length fields in the global set shall follow the same syntax.

Global sets can accommodate recursion, so that the UL key linked to a global tag may identify either a single data element from a dictionary or a data set or pack from a set or pack standard or recommended practice and the corresponding registry.

An informative example of the operation of global sets is given in annex F.

5.3 Local sets

A local set is defined as a number of data elements that are grouped to reduce the length of the keys for each element within the set. Elements may be in any order within the local set and may be present or absent.

The UL key of a local set shall be defined by an accompanying standard or recommended practice including a structure designator and an accompanying local set registry including a version number.

The UL key of a local set shall be 16 octets in length.

The length of a local set shall be coded by default as per ASN.1 BER length notation; long or short form as required.

The value of a local set shall be a sequence of KLV-encoded elements whose total length is given by the length field.

The UL key for local sets is described by table 7. The local set designator is defined within the last 8 octets in the local set UL key. The 16-octet local set key shall be defined in an associated standard or recommended practice and the local set UL key value shall be registered with the SMPTE Registration Authority to guarantee a unique local set UL key value.

The data structure for the encoding of local sets is illustrated in figure 4.

The 16-octet local set UL key is followed by the set length, which is followed by a number of elements, which shall each be triplets of local tag, length, and value.

The preferred size of the local tag fields is 1 octet, and the preferred specification of the length fields is ASN.1 BER short- or long-form encoding. The full range of allowed combinations of tag and length field lengths is defined by the registry designator, according to table 8.

A relevant local set standard or recommended practice shall define the link between the local tag of each element and the corresponding UL key value. This link shall be defined in a relevant local set standard or recommended practice that provides for each local tag the UL key of the defining element. This linking definition is a mechanism that gives users of this standard the flexibility to define their own aliases for highly efficient coding. Developers of local sets shall provide the mapping between each tag in a local set and the defining UL key. Unlike universal sets and global sets, where the UL key of each element in the set can be losslessly recreated, the UL key of each local set tag cannot be reconstructed without recourse to the defining standard or recommended practice and the corresponding registry.

Local sets can accommodate recursion so that the UL key linked to a local tag may identify either a single data element from a dictionary or a data set or pack from a set or pack standard or recommended practice and the corresponding registry.

Figure 5 is an informative illustration of the linking between a local tag and a full UL key.

5.4 Variable-length packs

A variable-length pack is similar to a local set, but does not have local tags. Thus, each element of a variable-length pack comprises only a length field and a value field. Elements in a variable-length pack must appear in the defined order.

The UL key of a variable-length pack shall be defined by an accompanying standard or recommended practice including a structure designator and an accompanying variable-length pack registry including a version number.

The UL key of a variable-length pack shall be 16 octets in length.

Table 6 – Coding of registry designator (octet 6) for global set syntax

Octet 6 value	Length fields	Description
0x02	BER short or long	Any length
0x22	1 octet	Length up to 255
0x42	2 octets	Length up to 65535
0x62	4 octets	Length up to $2^{32}-1$

Table 7 – Field descriptions for the UL key for local set encoding

No.	Field	Description	Length	Content/Format
1	UL header:			
1	OID	Object identifier	1 octet	Always 0x06
2	UL size	16-octet size of the UL	1 octet	Always 0x0E
3	UL designators:			
3	UL code	Concatenation of subidentifiers ISO, ORG	1 octet	Always 0x2B
4	SMPTE designator	SMPTE designator	1 octet	Always 0x34
5	Registry category designator	Sets and packs	1 octet	Always 0x02
6	Registry designator	Local sets	1 octet	See table 8
7	Structure designator	Designator of the structure variant within the local set registry	1 octet	Defined by the local set registry and standard or practice
8	Version number	Version of the local set registry which first defines the item specified by the local set designator	1 octet	Incrementing number
9-16	Local set designator:			
	Local set designator	Defines the local set placement in a hierarchical structure	8 octets	Defined by the local set registry and standard or practice

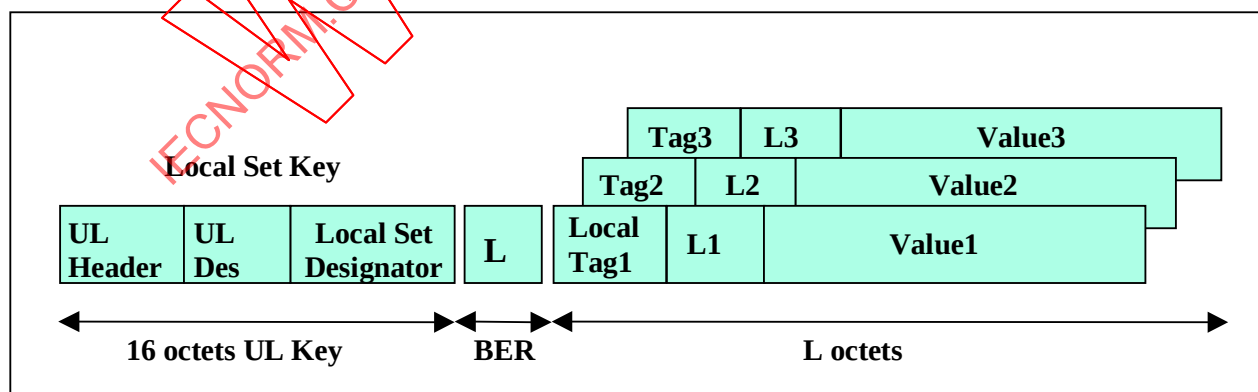


Figure 4 – KLV coded local set structure

Table 8 – Coding of registry designator (octet 6) for local set syntax

Octet 6 value	Length fields	Local tag fields length	Description
0x03	BER short or long	1 octet	Any length
0x13	BER short or long	2 octets	
0x1B	BER short or long	4 octets	
0x23	1 octet	1 octet	Length up to 255
0x33	1 octet	2 octets	
0x3B	1 octet	4 octets	
0x43	2 octets	1 octet	Length up to 65535
0x53	2 octets	2 octets	
0x5B	2 octets	4 octets	
0x63	4 octets	1 octet	Length up to $2^{32}-1$
0x73	4 octets	2 octets	
0x7B	4 octets	4 octets	

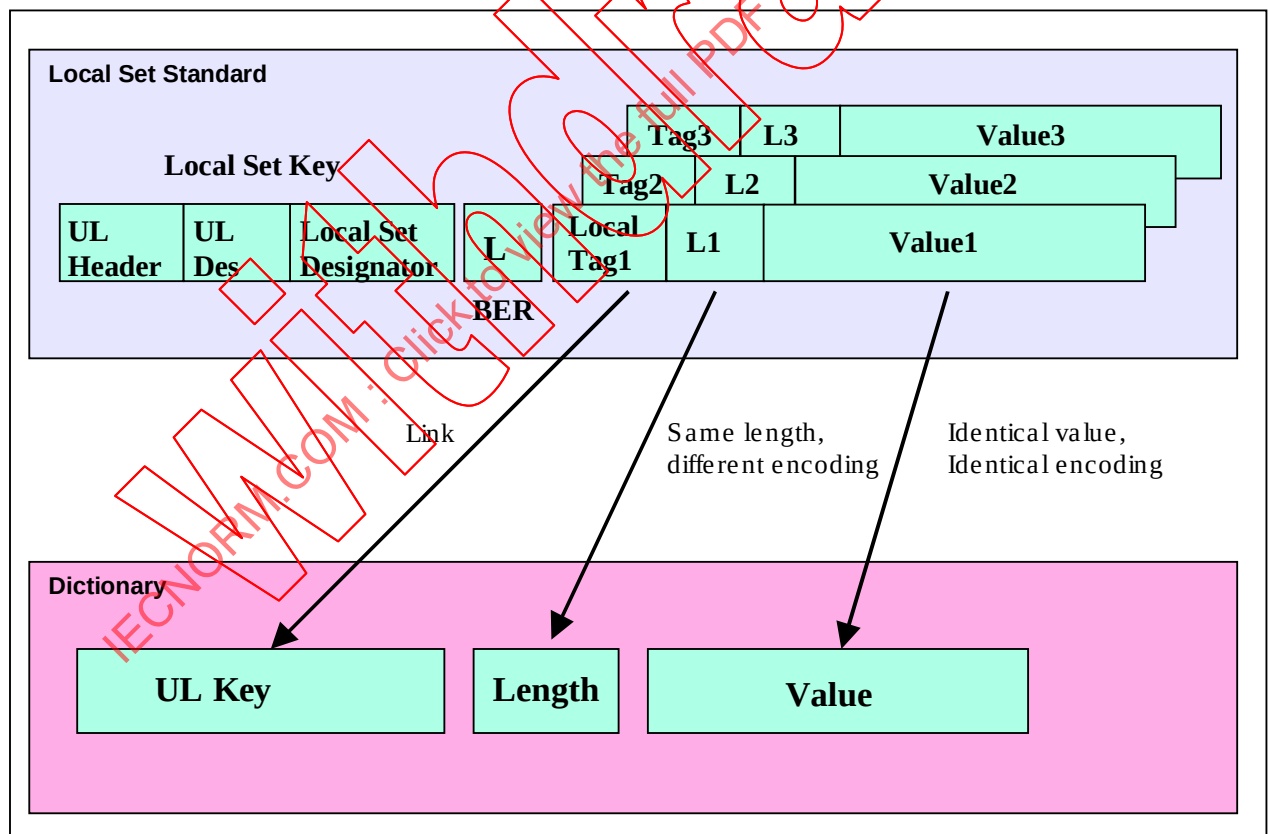


Figure 5 – Informative illustration of local set label to global key linking

The length of a variable-length pack shall be coded by default as per ASN.1 BER length notation; long or short form as required.

The value of a variable-length pack shall be a sequence of KLV-encoded elements whose total length is given by the length field.

The UL key for variable-length pack is described in table 9. The variable-length pack designator is defined within the last 8 octets in the local set UL key. The variable-length pack key shall be defined in an associated standard or recommended practice and the variable-length pack UL key value shall be registered with the SMPTE Registration Authority to guarantee a unique variable-length pack UL key value.

The data structure for the encoding of variable-length packs is illustrated in figure 6.

The 16-octet variable-length pack UL key is followed by the variable-length pack length (encoded using ASN.1 BER length encoding) which is followed by a number of elements which shall each be doublets of length and value.

The default specification of the length fields of individual elements is ASN.1 BER short- or long-form encoding. The full range of allowed length field lengths is defined by the registry designator, according to table 10. All length fields in the variable-length pack shall follow the same syntax.

Because the elements within a pack do not have a local tag, the order of the elements shall be specified by the defining standard or recommended practice.

A relevant variable-length pack standard or recommended practice shall define the link between each element and the corresponding UL key value by providing the UL key of the defining element. This linking definition is a mechanism that gives users of this standard the flexibility to define their own aliases for highly efficient coding. Developers of variable-length packs shall register the mapping between each tag in a variable-length pack and the defining UL key. Unlike universal sets and global sets, where the UL key of each element in the set can be losslessly recreated, the UL key of each element in a variable-length pack cannot be reconstructed without recourse to the defining standard or recommended practice and the corresponding registry.

Variable-length packs can accommodate recursion so that the UL key linked to an element may identify either a single data element from a dictionary or a data group from a set or pack standard or recommended practice and the corresponding registry.

5.5 Fixed-length packs

A fixed-length pack is defined as per the local set section, but does not have local tags. Thus, each element of a fixed-length pack is comprised of only a value field.

A fixed-length pack is similar to a variable length pack, but does not have length fields. Thus, each element of a fixed-length pack comprises only a value field. Elements in a fixed-length pack must appear in the defined order.

The UL key of a fixed-length pack shall be defined by an accompanying standard or recommended practice including a structure designator and an accompanying fixed-length pack registry including a version number.

The UL key of a fixed-length pack shall be 16 octets in length.

The length of a fixed-length pack shall be coded as per ASN.1 BER length notation; long or short form as required.

The value of a fixed-length pack shall be a sequence of elements whose total length is given by the length field.

The UL key for a fixed-length pack is described in table 11. The fixed-length pack designator is defined within the last 8 octets in the local set UL key. The fixed-length pack key shall be defined in an associated standard or recommended practice and the fixed-length pack UL key value shall be registered with the SMPTE Registration Authority to guarantee a unique fixed-length pack UL key value.

The data structure for the encoding of fixed-length packs is illustrated in figure 7.

Because the elements within a fixed-length pack do not have a local tag, the order of the elements shall be specified by the defining standard or practice.

Table 9 – Field descriptions for the UL key for variable-length pack encoding

No.	Field	Description	Length	Content/Format
1	UL header: OID	Object identifier	1 octet	Always 0x06
2	UL size	16-octet size of the UL	1 octet	Always 0x0E
3	UL designators: UL code	Concatenation of subidentifiers ISO, ORG	1 octet	Always 0x2B
4	SMPTE designator	SMPTE designator	1 octet	Always 0x34
5	Registry category designator	Sets and packs	1 octet	Always 0x02
6	Registry designator	Variable-length packs	1 octet	See table 10
7	Structure designator	Designator of the structure variant within the variable-length pack registry	1 octet	Defined by the variable-length pack registry and standard or practice
8	Version number	Version of the variable-length pack registry which first defines the item specified by the variable-length pack designator	1 octet	Incrementing number
9-16	Variable-length pack designator: Variable-length pack designator	Defines the variable-length pack placement in a hierarchical structure	8 octets	Defined by the variable-length pack registry and standard or practice

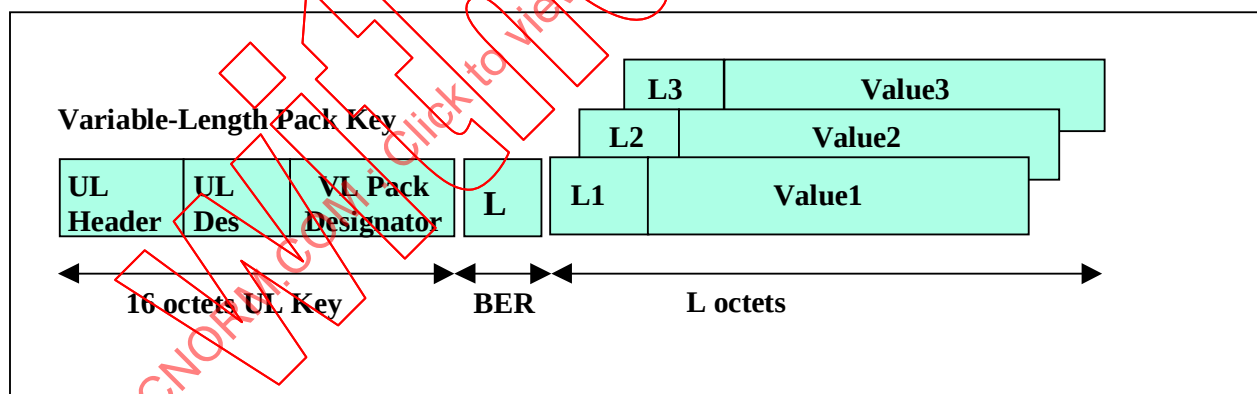


Figure 6 – KLV coded variable-length pack structure

Table 10 – Coding of registry designator (octet 6) for variable-length pack syntax

Octet 6 value	Length fields	Description
0x04	BER short or long	Default
0x24	1 octet	Length up to 255
0x44	2 octets	Length up to 65535
0x64	4 octets	Length up to $2^{32}-1$

Table 11 – Field descriptions for the UL key for fixed-length pack encoding

No.	Field	Description	Length	Content/Format
1	UL header:			
1	OID	Object identifier	1 octet	Always 0x06
2	UL size	16-octet size of the UL	1 octet	Always 0x0E
3	UL designators:			
3	UL code	Concatenation of subidentifiers ISO, ORG	1 octet	Always 0x2B
4	SMPTE designator	SMPTE designator	1 octet	Always 0x34
5	Registry category designator	Sets and packs	1 octet	Always 0x02
6	Registry designator	Fixed-length packs	1 octet	Always 0x05
7	Structure designator	Designator of the structure variant within the fixed-length pack registry	1 octet	Incrementing number
8	Version number	Version of the fixed-length pack registry which first defines the item specified by the fixed-length pack designator	1 octet	Incrementing number
9-16	Fixed-length pack designator:			
	Fixed-length pack designator	Defines the fixed-length pack placement in a hierarchical structure	8 octets	Defined by the fixed-length pack registry and standard or practice

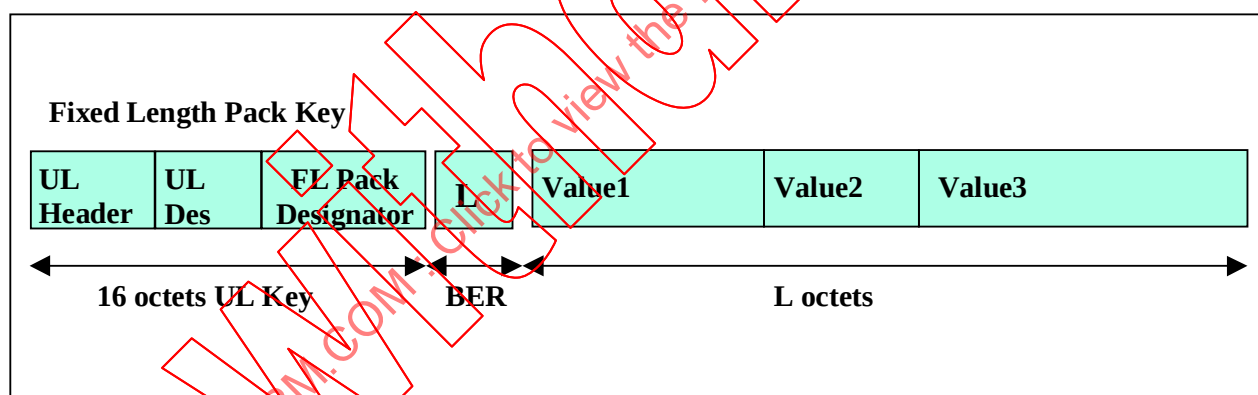


Figure 7 – KLV coded fixed-length pack structure

A relevant fixed-length pack standard or recommended practice shall define the link between each element and the corresponding UL key value by providing the UL key of the defining element. This linking definition is a mechanism that gives users of this standard the flexibility to define their own aliases for highly efficient coding. Developers of fixed-length pack packs shall register the mapping between each tag in a fixed-length pack pack and the defining UL key. Unlike universal sets and global sets, where the UL key of each element in the set can be losslessly

recreated, the UL key of each element in a fixed-length pack pack cannot be reconstructed without recourse to the defining standard or recommended practice and the corresponding registry.

Fixed-length packs can accommodate recursion so that the UL key linked to an element may identify either a single data element from a dictionary or a data group from a set or pack standard or recommended practice and the corresponding registry.

6 Labels

Labels shall be used to identify any object whose meaning is entirely conveyed by the label itself, and there is no requirement for an independent value. Thus, a label does not need either a length field or a value field. Labels shall be defined in the labels dictionary. A label is illustrated in figure 8.

Within wrappers and containers, and sometimes even in sets, there is sometimes the need to identify

aspects of the data contents which are not identified by the set, wrapper, or container UL key. Such an aspect can be identified by including a label in the set, wrapper, or container as a data item. It is necessary to define the presence of a label at a high level in the UL key so that decoders are aware that the item is a label only and not a KLV coded item.

The structure of the UL key for labels is defined by table 12.

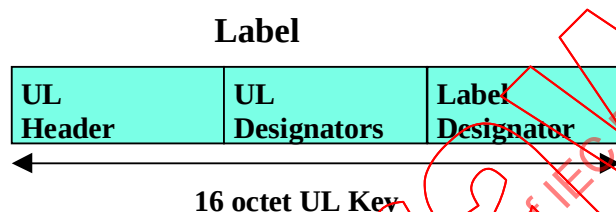


Figure 8 – UL key for labels

Table 12 – Field descriptions for the UL key for labels

No.	Field	Description	Length	Content/Format
1	UL header: OID	Object identifier	1 octet	Always 0x06
2	UL size	16-octet size of the UL	1 octet	Always 0x0E
3	UL designators: UL code	Concatenation of subidentifiers ISO, ORG	1 octet	Always 0x2B
4	SMPTE designator	SMPTE designator	1 octet	Always 0x34
5	Registry category designator	Labels	1 octet	Always 0x04
6	Registry designator	Specific labels registry	1 octet	Incrementing number
7	Structure designator	Designator of the structure variant within the labels registry	1 octet	Incrementing number
8	Version number	Version of the labels registry which first defines the item specified by the label designator	1 octet	Incrementing number
9-16	Label designator: Label designator	Defines the label's placement in a hierarchical structure	8 octets	Defined by the labels registry and standard or practice

Annex A (normative)

Glossary of terms

A.1 basic encoding rules (BER): An ISO standard encoding for various constructs in ASN.1. Includes the encoding of object identifiers and also of length fields. The length octets of the KLV packet shall conform to the basic encoding rules (BER) for either the short-form or long-form encoding specified in ISO/IEC 8825-1, pars. 8.1.3.4 and 8.1.3.5.

A.2 container: A generic name for a data object which provides a framework to contain different kinds of information. The term is commonly applied to multimedia where audio, video, data essence, and metadata are formed into a single data object.

A.3 essence: Identified by the EBU/SMPTE Task Force for Harmonized Standards for the Exchange of Program Material as Bitstreams as video, audio, and/or data information. Essence could also be graphics, telemetry, photographs, or other information.

A.4 metadata: Generally referred to as data about data or data describing other data. More specifically, information that is considered ancillary to or otherwise directly complementary to the essence. Any information that a content provider considers useful or of value when associated with the essence being provided.

A.5 metadata dictionary: The standard database of approved, registered data element tags, their definitions, and their allowed formats.

A.6 metadata item: A broad term for a unit of metadata.

A.7 object identifier (OID): The first octet in the UL that identifies it as a UL — abbreviated OID. Always 06 in hexadecimal (hex) notation (0x06).

A.8 octet: An 8-bit word; directly equivalent to the commonly used byte.

A.9 primitive encoding: In ASN.1 notation, a definite-length encoding method that applies to simple encoding types and types derived from simple types by implicit tagging. It requires that the length of subidentifiers be known in advance.

A.10 SMPTE Registration Authority: A registration organization which keeps a record of the use of ANSI/SMPTE 298M UL keys and other reference data.

A.11 type or data type: Information about the representation of the data value.

A.12 wrapper: Identified by the EBU/SMPTE Task Force for Harmonized Standards for the Exchange of Program Material as Bitstreams as a means of wrapping video, audio, data essence, and metadata information into a common framework. In this definition, it is identical to the definition of a container, but wrappers may further be used to wrap further metadata around an already defined container. In this sense, a container is a multipurpose box which has audio-visual information and a wrapper is the packaging around the box including labeling and other supporting metadata.

Annex B (informative)

Organization of references

The organization of SMPTE standards and recommended practices addressing the coding of individual data items such as essence and metadata is illustrated in figure B.1. No single standard can contain all of the information needed to describe and encode all data. This encoding protocol standard and the metadata dictionary standards form the

SMPTE normative standards for defining metadata and its coding. Informative SMPTE documents supplement the standards for encoding with examples and administrative instructions on managing the data standardization and registration process.

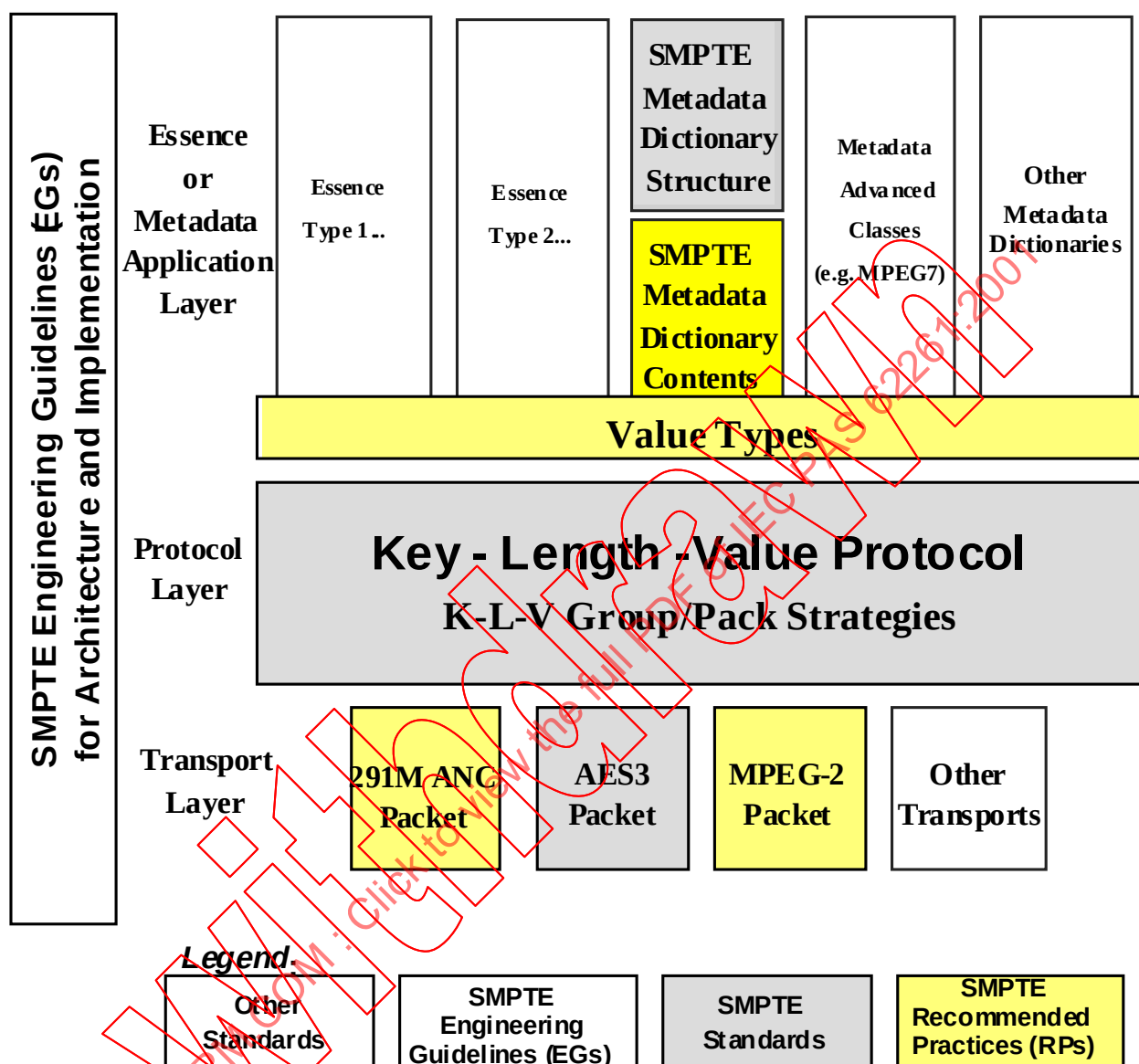


Figure B.1 – Organization of references

Annex C (informative)

Example usage of SMPTE UL

An expanded example of SMPTE universal label fields for metadata encoding is shown in table C.1. An example of

SMPTE universal label fields for metadata encoding is shown in figure C.1

Table C.1 – Expanded example of SMPTE universal label fields for metadata encoding

Octet No.	Value (hex)	Example explanation	Reference
1	0x06	UL object identifier	ANSI/SMPTE 298M
2	0x0E	UL size	ANSI/SMPTE 298M
3	0x2B	Concatentation of designators ISO, ORG	ANSI/SMPTE 298M
4	0x34	SMPTE designator	ANSI/SMPTE 298M
5	0x01	SMPTE dictionaries designator	SMPTE Registration Authority
6	0x01	Metadata dictionary designator	SMPTE Registration Authority
7	0x01	Structure standard reference number	SMPTE Registration Authority
8	0x01	Standard version number	SMPTE Registration Authority
9	0x01	Metadata class: Identifiers and locators	Metadata dictionary
10	0x01	Unique identifier subclass	Metadata dictionary
11	0x11	ISO identifiers	Metadata dictionary
12	0x01	ISO audio-visual number (ISAN)	Metadata dictionary
13	0x00	Unused	Metadata dictionary
14	0x00	Unused	Metadata dictionary
15	0x00	Unused	Metadata dictionary
16	0x00	Unused	Metadata dictionary

06 0E 2B 34 01 01 01 01 01 01 11 01 00 00 00 00

NOTE – Hex-encoded octets; 0x removed and separated for readability.

Figure C.1 – Example SMPTE universal label fields for metadata encoding

Annex D (informative)

Example of the KLV encoding of a single metadata item

Table D.1 shows an example of the fields that comprise the KLV protocol used for an individual value encoding of a human-assigned main title for a video segment. For clarity, each octet of the UL key is separated by spaces.

Table D.1 – Informative example of K-L-V individual value encoding of metadata

Key (hex encoded)	06 0E 2B 34 01 01 01 01 01 05 01 02 00 00 00 00 _h
Description	Main title (ISO 7-bit char)
Length (binary) [hex]	0×10
Value (ASCII)	Yesterday's World

Annex E (informative)

Example of a universal set

In the example universal metadata set in table E.1, the three elements of main title, ISAN number, and supply organization can be in any order and each entry is self-contained with its own individual universal key-length-value. Similarly, if one or more of the elements of the defined universal set is missing, the remaining valid parts of the universal set can still be recovered because each has its own key-length-value combination.

Table E.1 – Informative example of K-L-V universal set encoding of metadata (octets separated by spaces for readability)

Universal set UL	06 0E 2B 34 02 01 01 01 01 01 01 01 00 00 00 00
Universal set length	0×59
Universal key 1	06 0E 2B 34 01 01 01 01 01 05 01 02 00 00 00 00
Description	Main title (ISO 7-bit char)
Length 1	0×10
Value 1	Yesterday's World
Universal key 2	06 0E 2B 34 01 01 01 01 01 01 11 00 00 00 00 00 _h
Description	ISAN number
Length 2	0×10
Value 2	01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16
Universal key 3	06 0E 2B 34 01 01 01 01 02 01 01 00 00 00 00 00 _h
Description	Supply organization (ISO 7-bit char)
Length 3	0×06
Value 3	WXYZ15

Annex F (informative)

Example of a global set

In the example global metadata set in table F.1, the three elements of main title, ISAN number, and supply organization can be in any order and each entry is self-contained with its own individual global tag-length-value. Similarly, if one

or more of the elements of the defined global set is missing, the remaining valid parts of the global set can still be recovered because each has its own tag-length-value combination.

**Table F.1 – Informative example of K-L-V global set encoding of metadata
(octets separated by spaces for readability)**

Global set UL	06 0E 2B 34 02 02 01 01 06 0E 2B 34 01 01 01 01
Global set length	0x36
Global tag 1	01 05 01 02 00
Original UL key	06 0E 2B 34 01 01 01 01 01 05 01 02 00 00 00 00
Description	Main title (ISO 7-bit char)
Length 1	0x10
Value 1	Yesterday's World
Global tag 2	01 01 11 00
Original UL key	06 0E 2B 34 01 01 01 01 01 01 11 00 00 00 00 00
Description	ISAN number
Length 2	0x10
Value 2	01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16
Global tag 3	02 01 01 00
Original UL key	06 0E 2B 34 01 01 01 01 02 01 01 00 00 00 00 00
Description	Supply organization (ISO 7-bit char)
Length 3	0x06
Value 3	WXYZ15

Annex G (informative)

Example of a local set

In the example local metadata set in table G.1, the three elements of main title, ISAN number, and supply organization can be in any order and each entry is self-contained with its own individual local tag-length-value. Similarly, if one or

more of the elements of the defined local set is missing, the remaining valid parts of the local set can still be recovered because each has its own local tag-length-value combination.

**Table G.1 – Informative example of K-L-V local set encoding of metadata
(octets separated by spaces for readability)**

Local set UL	06 0E 2B 34 02 03 01 01 06 0E 2B 34 01 01 01 01
Local set length	0x2c
Local tag 1	0x01
Original UL key	Specified by defining standard or practice
Description	Main title (ISO 7-bit char)
Length 1	0x10
Value 1	Yesterday's World
Local tag 2	0x02
Original UL key	Specified by defining standard or practice
Description	ISAN number
Length 2	0x10
Value 2	01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16
Local tag 3	0x03
Original UL key	Specified by defining standard or practice
Description	Supply organization (ISO 7-bit char)
Length 3	0x06
Value 3	WXYZ15

Annex H (informative)

Example of a variable-length pack

In the example variable-length pack in table H.1, the three elements of main title, ISAN number, and supply organization must be in the order specified and must all be present.

If one or more of the elements of the defined variable-length pack is missing, the remaining valid parts of the variable-length pack cannot be recovered.

Table H.1 – Informative example of K-L-V variable-length pack encoding of metadata (octets separated by spaces for readability)

VL pack UL	06 0E 2B 34 02 04 01 01 06 0E 2B 34 01 01 01 01
VL pack length	0x29
Original UL key	Specified by defining standard or practice
Description	Main title (ISO 7-bit char)
Length 1	0x10
Value 1	Yesterday's World
Original UL key	Specified by defining standard or practice
Description	ISAN number
Length 2	0x10
Value 2	01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16
Original UL key	Specified by defining standard or practice
Description	Supply organization (ISO 7-bit char)
Length 3	0x06
Value 3	WXYZ15

Annex I (informative)

Example of a fixed-length pack

In the example fixed-length pack in table I.1, the three elements of main title, ISAN number, and supply organization must be in the order and of the length specified. If one

or more of the elements of the defined fixed-length pack is missing, the remaining valid parts of the fixed-length pack cannot be recovered.

Table I.1 – Informative example of K-L-V fixed-length pack encoding of metadata (octets separated for readability)

FL pack UL	06 0E 2B 34 02 01 01 01 06 0E 2B 34 01 01 01 01
FL pack length	0x26
Original UL key	Specified by defining standard or practice
Description	Main title (ISO 7-bit char)
Value 1	Yesterday's World
Original UL key	Specified by defining standard or practice
Description	ISAN number
Value 2	01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16
Original UL key	Specified by defining standard or practice
Description	Supply organization (ISO 7-bit char)
Value 3	WXYZ15

Annex J (informative)

Example of a label

An example of a label is given in table J.1.

Table J.1 – Example of a label

Label UL	06 0E 2B 34 04 01 01 01 11 22 33 44 55 00 00 00
Description	1/2-in type J cassette
NOTE – Octets separated by spaces for readability.	

Annex K (informative)

Bibliography

ISO/IEC 8824-1:1998 (ITU-T X.680), Information Technology — Abstract Syntax Notation One (ASN.1) — Specification of Basic Notation

Final Report: Analyses and Results, EBU/SMPTE Task Force for Harmonized Standards for the Exchange of Program and Material as Bitstreams, July 1998. SMPTE J.107:605-815

PROPOSED SMPTE STANDARD

SMPTE 359M

for Television and Motion Pictures — Dynamic Documents

Page 1 of 14 pages

1 Scope

1.1 There is a need in the field of information technology for the unambiguous identification of objects to provide interoperability among information systems. Individual standards committees have divined, as part of their development of technical standards, classes of objects. Specific objects are the individual members of the class of objects. Registration is the process whereby unambiguous names are formally associated with objects. This may be done by an organization, a standard, or an automated facility.

1.2 Within the television and motion-picture industries, there is a need for engineering documents (standards, recommended practices, and engineering guidelines) which can easily and rapidly be extended to cover new requirements (dynamic documents). Such documents typically contain tables of values, parameters, or other entities that cannot be fully defined at the time the document is written.

1.3 Through a process described in this standard, the dynamic tables described above are established as registers to be administered by the SMPTE Registration Authority (SMPTE RA).

1.4 Dynamic documents are created using the same administrative practices as conventional SMPTE documents. Once a dynamic document is adopted as an engineering document, only designated entities within a dynamic document are subject to change by the dynamic document process. As with conventional engineering documents, the base document can be modified, but only in accordance with existing administrative practices.

1.5 Four types of registers are defined. These types differ in their procedures for adding or modifying the data contained within the registers.

1.6 In this standard, *shall* denotes a mandatory provision of the standard, *should* denotes a provision that is recommended but not mandatory, and *may* denotes a provision that is optional.

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.

ISO/IEC JTC 1 Directives, Procedures for the Technical Work of ISO/IEC JTC 1 on Information Technology, Third Edition, 1995

Society of Motion Picture and Television Engineers Administrative Practices, Section XIII, Engineering

3 Definitions

3.1 data: A representation of facts, concepts, or instructions in a formalized manner, suitable for communication, interpretation, or processing by humans or automatic means.

3.2 data element: A unit of data for which the definition, identification, representation, and permissible values are specified by means of a set of attributes.

3.3 engineering document: A SMPTE standard, recommended practice, or engineering guideline, or equivalent document from another organization.

3.4 register: A set of files (paper, electronic, or a combination) containing the assigned data elements and the associated information. (Definition adapted after that in annex E of the ISO/IEC Directives.)

3.5 registered data element: A data element that has been entered into a register kept by a registration authority.

3.6 registration authority (RA): The organization established by the SMPTE Registration Authority, LLC which is authorized to register data elements.

3.7 registration authority board (RA Board): The registration authority board consists of the board of directors of the SMPTE Registration Authority, LLC.

4 Types of data elements

4.1 Type

Dynamic documents shall specify the type to which each registered data element within that document belongs, together with the information that must be supplied with each request for registration. The

Standards Committee shall specify which technology committee or other body is charged with reviewing the request.

4.2 Data set

An engineering document establishing a dynamic document shall specify an original set of data to be entered into the register once the engineering document has been approved.

4.3 Extension or change

Portions of the dynamic document that are subject to extension or change shall be clearly labeled as such, and shall be classified according to type as defined below. Assignment of registered data element type shall be subject to ballot and approval per applicable SMPTE administrative practices as is the rest of the document.

4.4 Maintenance

An engineering document establishing a dynamic document shall specify the RA responsible for maintenance and upkeep of any registered data elements specified in the engineering document. The engineering document may also specify locations where registers and registered data elements may be found in electronic form.

Table 1 outlines the difference among registered data element types.

Table 1 – Characteristics of registered data element types

Registered data element type	1	2	3	4
Supporting engineering document	✓			
Technical comment period	✓			
Review for technical merit	✓			
Ballot for technical merit	✓			
Public notice of ballot	✓	✓		
Consensus	✓	✓		
Standards Committee procedural review and approval	✓	✓		
Trial publication for public comment	✓	✓	✓	
Detailed format description	✓	✓	*	
Statement of intention to apply and date of first use			✓	3
Complete application required	✓	✓	3	3
NOTE – ✓ = required; * = may be required.				

4.5 Type 1 registers

Additions to a type 1 register shall be subject to review for technical merit, adequacy of information provided, nonconflict with existing engineering documents, and compliance with type 1 requirements. Additions to a type 1 register shall require an underlying engineering document to support any addition (see figure 1).

Example: If a document is extended to include a new type of ancillary data, at least a first draft of a SMPTE engineering document must exist describing the new ancillary data.

4.5.1 Information required for additions to type 1 registers

The following information shall be provided by any organization, individual, or committee wishing to make additions to a type 1 register:

- 1) Contact information for the organization, individual, or committee requesting the addition;
- 2) The supporting engineering document used as the basis for the submission;
- 3) A request specifying the addition to the register;
- 4) Identification of the specific register to which the addition is to be made;
- 5) Detailed information regarding the purpose and use of the addition to the register;
- 6) Name of authorized representative of the organization requesting the addition.

4.6 Type 2 registers

Additions to a type 2 register shall be subject to review for adequacy of information, including technical description, nonconflict with existing engineering documents, and compliance with type 2 requirements. Additions to a type 2 register shall not be subject to review for technical merit. Additions to a type 2 register shall not require a supporting SMPTE engineering document (see figure 2).

During the ballot process for a change in a type 2 registered data element, negative votes based upon procedural issues, including adequacy of technical description, shall be accepted. Negative votes based upon technical merit shall not be considered. Exam-

ple: The addition of a term to the metadata dictionary is an example of a type 2 data element.

4.6.1 Information required for additions to type 2 registers

The following information shall be provided by any organization, individual, or committee wishing to make additions to a type 2 register:

- 1) Contact information for the organization, individual, or committee requesting the addition;
- 2) A request specifying the addition to the register;
- 3) Detailed information regarding the purpose and use of the addition to the register;
- 4) Name of authorized representative of the organization requesting registration.

4.7 Type 3 registers

Additions to a type 3 register shall be reviewed for adequacy of information and compliance with type 3 requirements. Additions to a type 3 register shall not be subject to due process review (see figure 3).

Example: An example of a type 3 data element is an item in the portion of the metadata dictionary assigned for prototype purposes.

4.7.1 Information required for additions to type 3 registers

The following information shall be provided by any organization, individual, or committee wishing to make additions to a type 3 register:

- 1) Contact information for the organization, individual, or committee requesting the addition;
- 2) A request specifying the addition to the register;
- 3) Detailed information regarding the purpose and use of the addition to the register;
- 4) A detailed description of the format specification may be required;
- 5) Statement of intention to apply the registered data element, and intended date of first use;

6) Name of authorized representative of the organization requesting the addition.

4.8 Type 4 registers

Additions to a type 4 register shall be reviewed for adequacy of information and compliance with type 4 requirements. Additions to a type 4 register may require a fee payment before changes or additions will be accepted. Additions to a type 4 register shall not be examined for technical merit. Additions to a type 4 register shall not be subject to consensus review or trial publication (see figure 4).

Example: The registration of an MPEG RID or UPID root number would be a type 4 data element.

4.8.1 Information required for additions to type 4 registers

The following information shall be provided by any organization, individual, or committee wishing to make an addition to a type 4 register:

- 1) Contact information for the organization, individual, or committee requesting the addition;
- 2) Statement of intention to apply the registered data element, and intended date of first use;
- 3) Name of authorized representative of the organization requesting the addition to the registry.

5 Deletion of registered data elements

5.1 Any request for deletion of a registered data element shall result in the posting of an appropriate public notice giving the specifics of the proposed deletion. The following information shall be required before a deletion shall be considered:

- 1) Contact information for the organization, individual, or committee requesting the deletion;
- 2) Any supporting document that may have been used as the basis for an original request for creation of the registered data element;
- 3) A request specifying the deletion of the registered data element along with a complete justification for the deletion;

4) Identification of the specific register to which the deletion is to be made;

5) Name of authorized representative of the organization requesting the deletion.

5.2 To give users an opportunity to disagree with the deletion, the registered data element to be deleted will be marked as such for a one-year period. If, after this period, nobody identifies himself as a user, the registered data element shall be deleted from the register. If even one objection is received concerning deletion of the registered data element, the data element shall not be deleted.

5.3 In the event that it is discovered after the fact that an application for a registered data element contained false or misleading information, the registered data element may be immediately deleted from the register at the sole discretion of the SMPTE Registration Authority.

5.4 With the exception of 5.3 above, a registered data element shall not be deleted from a register earlier than one year from the time public notice is given of the deletion.

5.5 Individual engineering documents may impose restrictions on deletion of a registered data element that are more restrictive than those specified here.

6 Deletion of a register

6.1 A register can only be deleted by a revision to a register's establishing engineering document, or through withdrawal of the engineering document establishing the register.

6.2 Any request for deletion of a registered data element shall result in the posting of an appropriate public notice giving the specifics of the proposed deletion.

6.3 To give users an opportunity to disagree with the deletion, the register to be deleted will be marked as such for a one-year period. If, after this period, nobody identifies himself as a user, the register shall be deleted. If even one objection is received concerning deletion of the register, the register shall not be deleted.

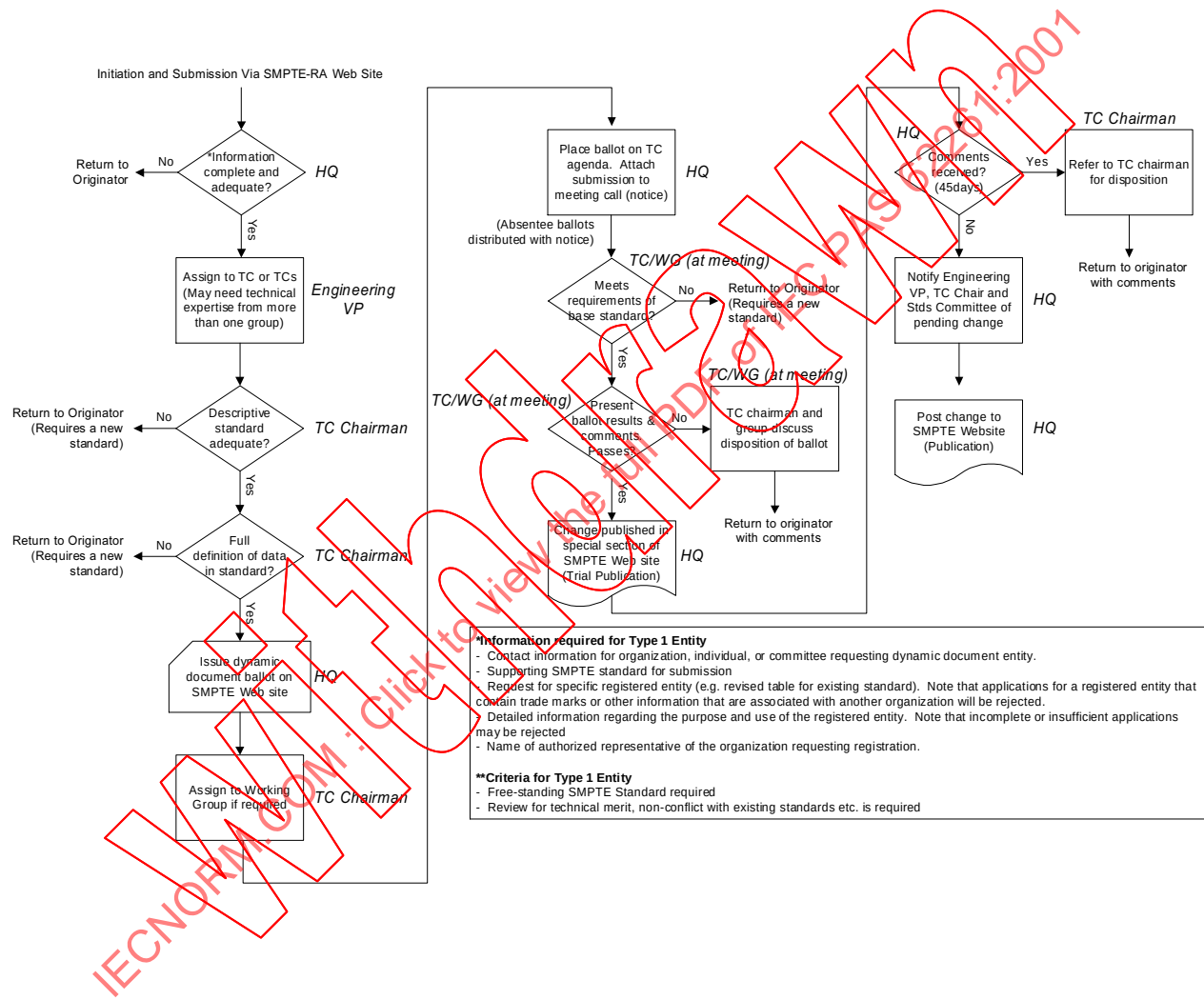


Figure 1 – Flow diagram for type 1 SMPTE dynamic document entity

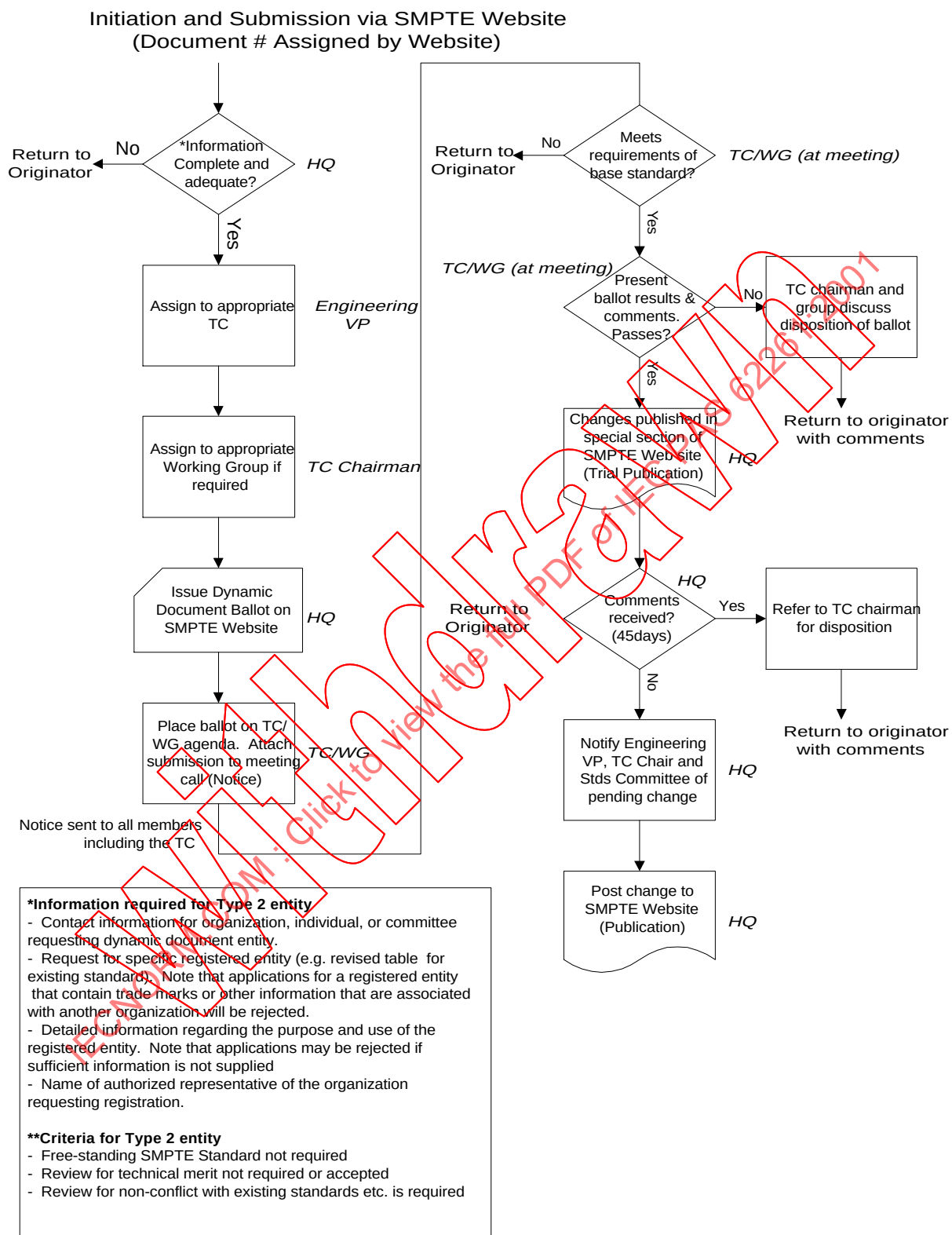


Figure 2 – Flow diagram for type 2 SMPTE dynamic document entity

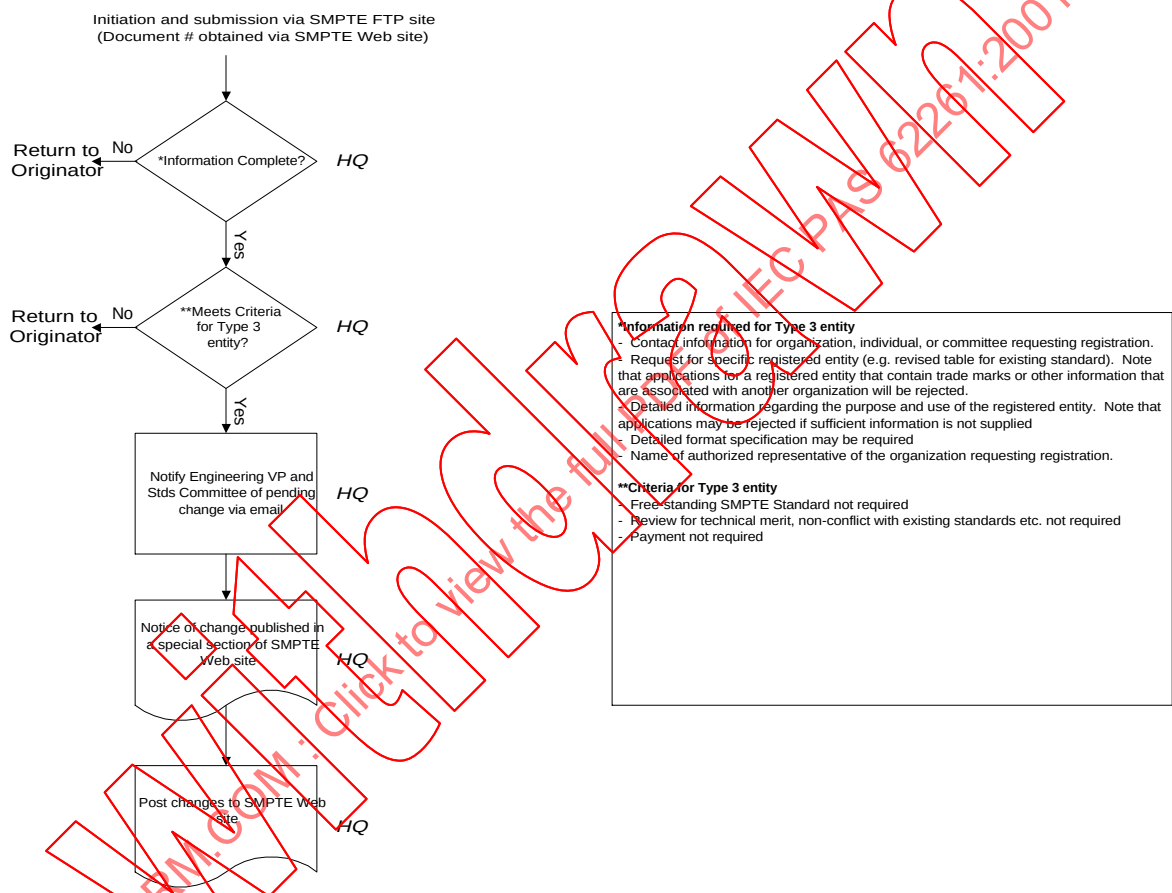


Figure 3 – Flow diagram for type 3 SMPTE dynamic document entity

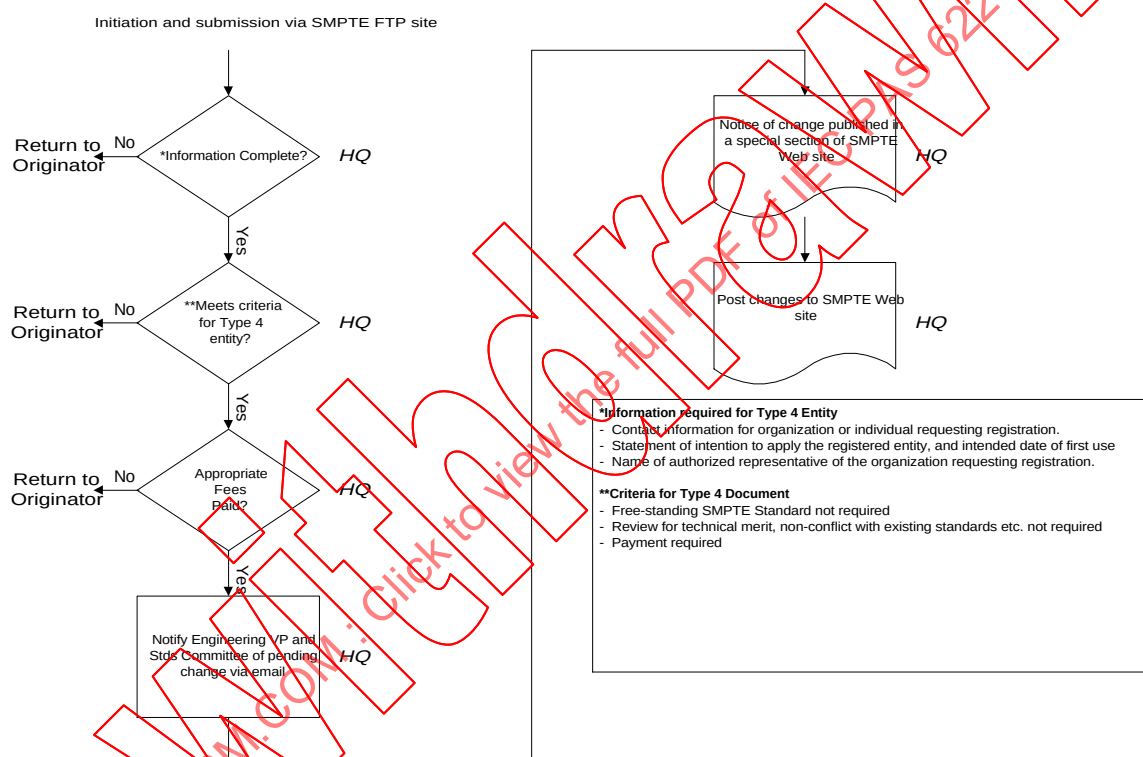


Figure 4 – Flow diagram for type 4 SMPTE dynamic document entity

6.4 In any event, a register shall not be deleted sooner than one year from the time public notice is given of the deletion.

6.5 Individual engineering documents may impose restrictions on deletion of registers that are more restrictive than those specified here.

7 Reuse of names

Names that have been previously published in the register may never be reused.

8 Changes to registered data elements

Any change to a registered data element shall be treated procedurally as a deletion of a registered data element followed by an addition of a new data element.

9 Changes to organization contact information for previously registered data elements

9.1 Applications for changes to organization contact information for previously registered data elements shall be accepted by the RA.

9.2 If the organization of record is still in existence, the request for the change must come from that organization. If the organization of record is not in existence, the organization requesting the change shall provide a statement in writing certifying that it has attempted to contact the organization of record on at least three occasions using different delivery methods without success.

9.3 The RA shall not accept any request for changes to organization contact information without either an authorization from the organization of record, or, should the requester be different from the organization of record, a statement in writing from the requester as described above.

9.4 The RA shall collect information related to a change in contact information for a previously registered data element in accordance with clauses 10 and 11.

9.5 The RA shall acknowledge receipt of a request for a change in contact information within five business days of receipt.

9.6 The RA shall publish a change in contact information in the appropriate register within 30 days of approval of such request.

10 Minimum content of all registers

At a minimum, all registers shall contain:

- the assigned name;
- name of initial applicant;
- address of initial applicant;
- date of original assignment;
- date of last transfer of assignment, if allowed (updateable);
- name of current owner (updateable);
- address of current owner (updateable);
- if the owner is an organization, the name, title, postal and email address, and telephone and facsimile number of a contact person within the organization (updateable);
- date of last update (updateable);
- where required by the technical standard, a technical definition of the object.

Note that, in the case where the name of the initial applicant is SMPTE, only the name of the initial applicant is required.

11 Minimum content of forms

11.1 The contents of forms (paper, electronic, or a combination of both) for registration application, request for update, notification of assignment or update, and rejection of application shall include:

- name of applicant;
- address of applicant;
- if the applicant is an organization, the name, title, postal and email address, and telephone and facsimile number of a contact person within the organization.

Depending on the type of form, additional information to be included shall be:

- data to be updated, old and new values (request for update);
- authorization to release specific data (registration application);
- any justification required for the assignment (registration application);
- reasons for action taken (notification of assignment or update, and rejection of application);
- where required by the technical standard, a technical definition of the object to be registered (registration application).

11.2 Any supporting engineering document shall define any additional information required.

12 Multiple types permitted

12.1 Only portions of an engineering document designated as registered data elements shall be subject to addition, deletion, or change according to the dynamic document process. The rest of the document shall be modified according to existing SMPTE administrative procedures for nondynamic documents.

12.2 A dynamic document may include several registers.

12.3 A dynamic document may include registered data elements of several types.

13 Rejection of application

13.1 Applications for registration of data elements that contain trademarks or other information that is associated with organizations other than the submitting organization shall be rejected.

13.2 Applications for registration of data elements that contain incomplete, insufficient, or incomprehensible information, as determined during the review process, may be rejected.

13.3 Applications that do not conform to technical requirements of the supporting standards may be rejected.

13.4 Applications that duplicate existing applications or existing registered data elements may be rejected.

13.5 Where fees are required, applications not accompanied by the appropriate fee will be rejected.

13.6 Applications containing false or misleading information may be rejected.

13.7 Failure to follow the procedures contained in this standard may cause the application to be rejected.

13.8 Applications from applicants that are ineligible to file an application may be rejected.

13.9 Where a justification is required, applications that contain inadequate justification as determined during the review process may be rejected.

14 Submission, review and appeal process

14.1 New registers and original registered data elements shall be created when an engineering document containing such items is formally approved.

14.2 Submission of additions, deletions, and changes to a registered data element shall follow the procedures described above.

15 Registration Authority function and responsibilities

15.1 General

15.1.1 The RA shall be responsible for maintaining all registers for the Society of Motion Picture and Television Engineers and other organizations as agreed to by the RA Board, in a way agreed to by the RA board.

15.1.2 The current RA is listed in annex A.

15.1.3 The RA recognizes that its interests and those of its members and subscribers cannot take precedence over the general interests of users of the RA information worldwide. The effectiveness of the RA depends on the ability to

support the needs of all users in all countries and the recognition that all participants in the system should benefit equally.

15.1.4 The address of the RA Board is listed in annex B.

15.1.5 The RA shall submit to the RA Board a registration authority report two weeks prior to any scheduled meeting or as required. The report will summarize the activity of the RA between reporting periods. The detailed information contained in these reports will be determined between the RA and the RA Board.

15.1.6 The RA shall submit to the RA Board a registration management report consisting of any appeals or complaints acknowledged by the RA within the reporting period. The report will be produced at least six weeks prior to any meeting of the RA Board.

15.1.7 The RA shall maintain records of all completed requests for a minimum of three years. Requests shall include all additions, changes, and deletions.

15.1.8 The RA shall maintain standard operating procedures (SOPs) to be submitted to the RA Board for annual review. Any changes to the SOPs shall be approved by the RA Board.

15.1.9 The RA shall maintain strict confidentiality between the RA operating functions and other parts of its organization.

15.1.10 The RA shall comply with the appeals process administered by the RA Board.

15.1.11 The RA shall make available to any interested parties any registered information administered by the RA in both electronic and paper form. The RA shall keep accurate distribution records pertaining to its publications.

15.1.12 The RA's performance shall be monitored by the RA Board in accordance with the conditions documented in both this standard and the service level definition in annex C of this standard.

15.1.13 The RA may appeal to the RA Board for arbitration if it regards a request as being frivolous or unreasonable for any reason.

15.1.14 The RA may consult with the technical group responsible for the engineering document and the group responsible for development of this standard. In addition, it may consult with the RA Board.

16 RA responsibilities to requesters

16.1 The RA shall be responsible to requesters as follows:

16.1.1 Assisting the requester with completion of the request form;

16.1.2 Provide timely response to all requests. This includes confirmation and processing of the request;

16.1.3 Provide detailed explanation of all responses, if required, in English;

16.1.4 Provide assistance for general information and service issues;

16.1.5 Fulfill the duties of providing additions, amendments, and deletions;

16.1.6 Advise the requester of the appeals process if the requester is dissatisfied with the RA determination.

17 Ownership of data

The data which constitutes any registered entities are the property of the SMPTE Registration Authority, LLC.

18 Procedural changes

The service level definition set forth to maintain registries established in engineering documents shall be the responsibility of the RA and the RA Board. Any subsequent changes will require the approval of the RA Board. The service level definition supporting this standard is included in annex C.

19 Appeals

19.1 Requesters should make reasonable efforts to resolve problems directly with the RA outside of this appeals process.

19.2 If there is a dispute between an applicant and the RA, the RA will make reasonable efforts to resolve the dispute.

19.3 Requesters should review clause 13 of this standard for criteria applicable to the rejection of a registration application.

19.4 Any requester who believes that his application for registration has been unjustly denied shall have the right to appeal the matter at any stage of the process by notice to the RA. Such notice shall be delivered to the RA and shall contain the name and contact information for the applicant, a copy of the registration application, a written description of the circumstances involved, and why the applicant believes that his application should be approved.

19.5 If, in the opinion of the requester, the appeal is not satisfactorily resolved by the RA, a written appeal may be submitted within 30 days after the RA's decision to the RA Board, which shall act as the RA's board of appeals, for appropriate disposition. The appeal shall be submitted to the RA Board through the office of the RA. The appeal shall be forwarded by mail by the RA to the RA Board within 15 days after receipt and it shall have a disposition period of 30 days for RA

Board action, unless the next scheduled meeting of the RA Board is within 60 days after the filing of the appeal. If a meeting of the RA Board is scheduled within that time period, the requester may appear before the RA Board to make an oral presentation of his viewpoint.

19.6 Any member of the RA Board who participated in any way in the submission of the registration shall not be eligible to participate in the RA Board's consideration of an appeal.

19.7 The eligible members of the RA Board shall vote on the appeal. A vote of at least two-thirds of those casting ballots and at least a majority of the eligible members shall be required to overturn the decision of the RA.

19.8 The disposition of a formal appeal by the RA Board shall be reported within 10 days to the requester and to the RA at the next scheduled meeting of these groups. In the event a meeting of the RA is not scheduled within 30 days after the disposition action, a report shall be forwarded to the RA by mail within 10 days of the RA Board decision.

20 Complaints

Complaints may be sent to the RA Board regarding the service provided by the RA. All complaints shall be in written form. Complaints shall be service oriented and will not be considered as part of the appeals process. The RA Board will aim to respond to complaints within 90 calendar days of receipt.

Annex A (normative)

Designation of the registration authority

The organization appointed as the registration authority is:

SMPTE Registration Authority, LLC
595 W. Hartsdale Avenue
White Plains, NY 10607-1824

Annex B (normative)

Designation of the registration authority board

The registration authority board is:

Board of Directors
SMPTE Registration Authority, LLC
595 W. Hartsdale Ave.
White Plains, NY 10607-1824

Annex C (normative)

Service level definition

The service level definition highlights the changes to the registered entities that may be requested of the Registration Authority (RA), together with the expected response times.

C.1 Request for a new registered entity

Requests for the creation of a new entity must include all the items which are required by this standard for establishing the registered entity.

The RA will validate the completeness of the request and return a positive or negative acknowledgment of receipt within two weeks of receipt of the request. In cases where the request is invalid, the acknowledgment will state the reason or reasons for rejection of the request.

The RA will not take more than ten business days to analyze a request for a single registered entity. In the case of multiple concurrent demands, the RA will treat applications on a first-come first-served basis.

The RA may refuse to create a new registered entity in the following, nonlimitative, list of cases:

- The registered entity does not comply with requirements of the establishing standard;
- The registered entity does not comply with requirements of another SMPTE standard;
- A registered entity already exists which meets the request;
- A registered entity already exists which can be altered to meet the request.

C.2 Maintenance

The RA will maintain the integrity of all registers including adequate backup (such as off-premises storage) as may be agreed between the RA and the RA Board.

C.2 Exceptional circumstances

In exceptional circumstances, the RA Board may agree to allow the RA to modify the response times and priorities in the service level definition.

Annex D (normative) Accessing RA registries

The registration authority (RA) is responsible for providing access to registers to interested parties. The exact method and facilities may be modified from time to time provided there is prior written agreement with the RA Board.

D.1 The RA will make the registered entities available over the Internet, or an agreed substitute network. In doing so, the RA will generally follow the procedures set forth in annex H of the Procedures for the Technical Work of ISO/IEC JTC 1 on Information Technology, third edition, 1995. There is no restriction on who can access the information. The RA will not charge for the service.

NOTE - Annex H of the JTC 1 Procedures is a web-based document intended to be navigated with a web browser. It is available at URL www.jtc1.org/ (first select committee JTC 1, then select PROCEDURES).

D.2 The user screens will include the SMPTE logo and the wording *SMPTE Registration Authority, LLC*. This wording will appear on all screens. When provided in paper form by the RA, it shall include that same information on each page.

D.3 The RA will ensure that it is capable of satisfactorily handling the peak traffic that is expected under normal conditions.

D.4 The information available on the Internet, or an agreed substitute network, will be the latest master copy of the registered entities. The RA will not be entitled to publish in any way information that is later than that on the Internet master version. In particular, the RA will not be entitled to

publish provisional or interim information if this is not on the Internet version.

D.5 Detailed browsing and searching facilities will be agreed between the RA Board and the RA. It is expected that they will include:

- an ability to download registered entities;
- an ability to search for specific information within registered entities;
- an ability to review the revision history of a registered entity.

D.6 The RA will provide general administrative information over the Internet. This will include:

- information about accessing the information;
- how to request a new registered entity;
- the response times for specific requests;
- the complaints procedure;
- forms for requesting new registered entities;
- information on how to obtain the latest relevant SMPTE standards.

D.7 The RA may provide registered entities in another format. The RA may charge a reasonable amount for such services.

Annex E (informative) Bibliography

ISO/IEC 2382-1:1993, Information Technology — Vocabulary — Part 1: Fundamental Terms

ISO/IEC 2382-4: 1999, Information Technology — Vocabulary — Part 4: Organization of Data

ISO/IEC 11179, Information Technology — Specification and Standardization of Data Elements

SMPTE STANDARD

for Television — Unique Material Identifier (UMID)



Page 1 of 10 pages

1 Scope

This standard specifies the format of the unique material identifier (UMID). The UMID is a unique identifier for picture, audio, and data material which is locally created but globally unique. It differs from many unique identifiers in that the number does not depend wholly upon a registration process, but can be generated automatically at the point of creation without reference to a central database.

The UMID consists of an ordered set of components each providing a key aspect to the identification of material, be it picture, audio, or data. The UMID may exist in one of two forms:

- A basic UMID which contains the minimum components necessary for the unique identification of a material clip; and
- An extended UMID which attaches metadata to the basic UMID to define a unique signature for each content unit within a clip.

This standard specifies the formats of each component in both the basic UMID and the extended UMID.

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

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

Forthcoming SMPTE 336M, Television — Data Encoding Protocol Using Key-Length-Value

Forthcoming SMPTE RP 210, Metadata Dictionary

ISO 3166-1:1997, Codes for the Representation of Names of Countries and Their Subdivisions — Part 1: Country Codes

ISO/IEC 8859-1:1998, Information Technology — 8-Bit Single-Byte Coded Graphic Character Sets — Part 1: Latin Alphabet No. 1

ISO/IEC 11578-1:1996, Information Technology — Open Systems Interconnection — Remote Procedure Call (RPC), Annex A, Universal Unique Identifier

3 General specification

A unique material identifier (UMID) allows the unique identification of all material so that it can always be recognized whether streamed or stored locally or remotely or archived.

For the purpose of this standard, both a content unit and a clip shall be defined as follows:

- A content unit is a quantum duration of material. The quantum duration of a content unit depends on the type of material and may vary from an audio