

SMPTE STANDARD

Material Exchange Format (MXF) —  
Operational Pattern 2a  
(Play-List Items, Single Package)



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## Foreword

SMPTE (the Society of Motion Picture and Television Engineers) is an internationally-recognized standards developing organization. Headquartered and incorporated in the United States of America, SMPTE has members in over 80 countries on six continents. SMPTE's Engineering Documents, including Standards, Recommended Practices, and Engineering Guidelines, are prepared by SMPTE's Technology Committees. Participation in these Committees is open to all with a bona fide interest in their work. SMPTE cooperates closely with other standards-developing organizations, including ISO, IEC and ITU.

SMPTE Engineering Documents are drafted in accordance with the rules given in Part XIII of its Operations Manual.

SMPTE ST 392 was prepared by Technology Committee 31FS.

## Intellectual Property

At the time of publication no notice had been received by SMPTE claiming patent rights essential to the implementation of this Standard. However, attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. SMPTE shall not be held responsible for identifying any or all such patent rights.

## 1 Scope

This standard defines operational pattern 2a for the exchange of an MXF file with a play-list of playable essence containers, each comprising either a single essence element or interleaved essence elements. It defines the operating restrictions, structural metadata objects and individual attributes that must be applied to the MXF file format specification to achieve interoperability when exchanging an MXF file as a list of continuously playable items of audio-visual material.

Operational pattern 2a is intended to meet the requirements of acquisition, storage and interchange applications that are satisfied by a play-list of individual items of content packaged in two or more essence containers each of the same type. Operational pattern 2a requires the use of body partitions for internal essence containers. Subdivision of each essence container by using body partitions is optional.

## 2 Conformance Notation

Normative text is text that describes elements of the design that are indispensable or contains the conformance language keywords: "shall", "should", or "may". Informative text is text that is potentially helpful to the user, but not indispensable, and can be removed, changed, or added editorially without affecting interoperability. Informative text does not contain any conformance keywords.

All text in this document is, by default, normative, except: the Introduction, any section explicitly labeled as "Informative" or individual paragraphs that start with "Note:"

The keywords "shall" and "shall not" indicate requirements strictly to be followed in order to conform to the document and from which no deviation is permitted.

The keywords, "should" and "should not" indicate that, among several possibilities, one is recommended as particularly suitable, without mentioning or excluding others; or that a certain course of action is preferred but not necessarily required; or that (in the negative form) a certain possibility or course of action is deprecated but not prohibited.

The keywords "may" and "need not" indicate courses of action permissible within the limits of the document.

The keyword "reserved" indicates a provision that is not defined at this time, shall not be used, and may be defined in the future. The keyword "forbidden" indicates "reserved" and in addition indicates that the provision will never be defined in the future.

A conformant implementation according to this document is one that includes all mandatory provisions ("shall") and, if implemented, all recommended provisions ("should") as described. A conformant implementation need not implement optional provisions ("may") and need not implement them as described.

Unless otherwise specified, the order of precedence of the types of normative information in this document shall be as follows: Normative prose shall be the authoritative definition; Tables shall be next; followed by formal languages; then figures; and then any other language forms.

## 3 Normative Reference

The following standard contains provisions which, through reference in this text, constitute provisions of this standard. At the time of publication, the edition indicated was 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 standard indicated below.

SMPTE ST 377-1:2011, Material Exchange Format (MXF) — File Format Specification

## 4 Glossary of Acronyms, Terms and Data Types

The full glossary of acronyms, terms and data types is given in the MXF file format specification, SMPTE ST 377-1. It is not repeated here to avoid any divergence of meaning.

## 5 Introduction

This standard defines MXF operational pattern 2a. In SMPTE ST 377-1, the properties of all generalized operational patterns are defined. In the MXF engineering guideline, SMPTE EG 377-3, the concepts of operational patterns and the general conditions for audio-visual material interchange and interoperability are described in outline form. The introductory sections of these documents are not repeated here.

### 5.1 Operational Pattern 2a Definition

Generalized MXF operational patterns are defined as a combination of the two dimensions as defined in SMPTE 377-1. This operational pattern shall be defined as follows:

#### 5.1.1 Item complexity

- Play-list items: The file contains two or more concatenated items. Each item shall be defined by a top-level file package. There shall be one material package having SourceClips each of which has a duration that is equal to the corresponding top-level file package.

#### 5.1.2 Package complexity

- Single package: The material package can only access a single top-level file package at a time.

The two dimensions of operational patterns are illustrated in informative Figure 1.

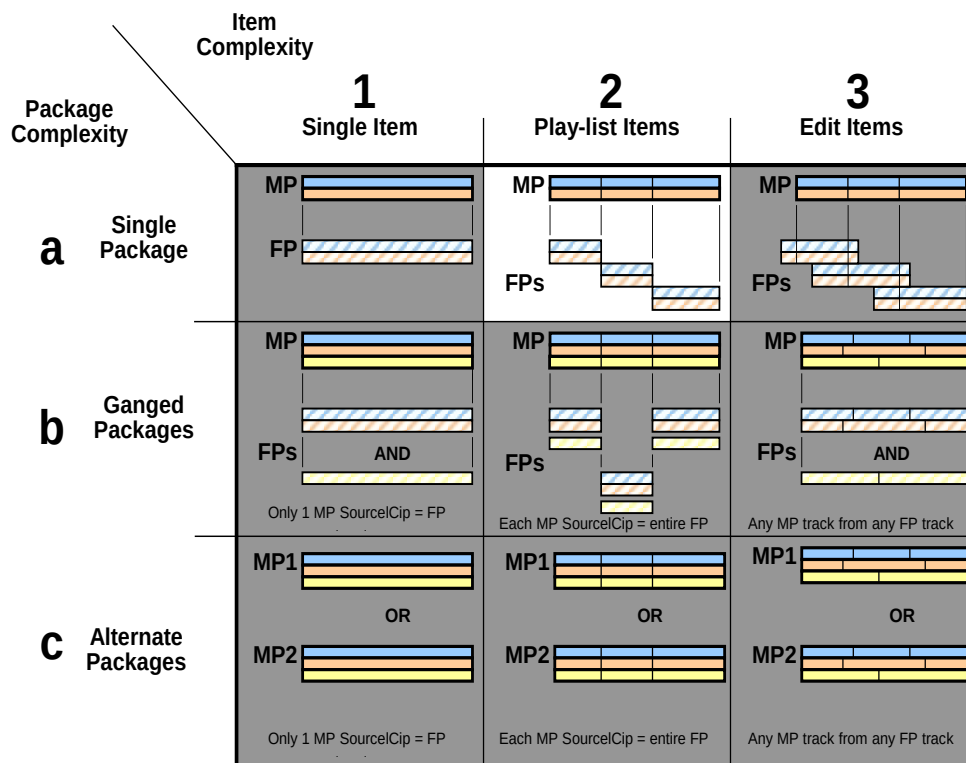


**Figure 1 – Item and package complexity** (Informative)

This operational pattern defines an MXF file as a single package of play-list items, as illustrated in the center-top box of Figure 1. All other standard operational patterns to the right or below this box are notionally a superset of the functionality of this operational pattern.

## 5.2 Material, File and Source Package Relationships

This operational pattern has multiple essence containers which shall be all of the same type, and may comprise either a single essence element or interleaved essence elements. The essence containers shall each comprise essence stream data that represents a continuous recording as illustrated in Figure 2.