

## **SMPTE Public Committee Draft**

# D-Cinema Distribution Master – Minimal Timed Text XML Requirements



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Document state	WD
Document type	RP
Document number	428-22
Document title	D-Cinema Distribution Master – Minimal Timed Text XML Requirements
Project Group	21DC DG Stereo Subtitling
Project Technology Committee	21DC
Project chair(s)	Matthew Sheby
Document editor(s)	Jack Watts

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## Foreword

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## Conformance

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; then formal languages; then figures; and then any other language forms.

## Introduction

SMPTE ST 429-2, section 9.8 Timed Text, states the following:

*"Once a timed text asset appears in one Reel, the established track shall be assumed to exist for the entire Composition, even if related timed text Asset elements are not present in all Reels."*

This statement implies that a timed text processor should expect a contiguous presence of Timed Text track files across all reels should one (1) or more reels require a timed text instance. Programmatically speaking, establishing the concept of a "track shall be assumed to exist" is inconsistent across D-Cinema playback devices accountable for reproducing timed text data. Such inconsistencies can result in timed text displayed out-of-sync, random display flashing, not displaying at all or the respective track file failing to decrypt.

To mitigate such behavior, RDD 52, section 8.3.1 states the following:

*If a MainSubtitle timed text track is present on any reel, a MainSubtitle timed text track shall be present on all reels. If (1) or more ClosedCaption timed text track(s) are present on any reel, the same number of ClosedCaption timed text tracks shall be present on all reels.*

*Note: For reels not needing Timed Text elements, the above may be accomplished by created a “blank” Timed Text asset track, which is outside the scope of this document.*

This document is the definition on how to create this “blank” ST 428-7 DCDM Subtitle file for inclusion inside the Timed Text asset track in the above referenced note.

## 1 Scope

This recommended practice is intended to specify the minimum required XML structure to adhere to when creating a ST 428-7 DCDM Subtitle file.

## 2 Normative References

The following standards contains provisions that, through reference in this text, constitute provisions of this Recommended Practice. Dated references require that the specific edition cited shall be used as the reference. Undated citations refer to the edition of the referenced document (including any amendments) current at the date of publication of this document. All standards are subject to revision, and users of this engineering document are encouraged to investigate the possibility of applying the most recent edition of any undated reference.

SMPTE, ST 429-2:2020 “D-Cinema Packaging — DCP Operational Constraints”

SMPTE, ST 428-7:2014 “D-Cinema Distribution Master — Subtitle”

## 3 Terms and Definitions

For the purposes of this document, the definition of the terms that are used can be found in their respective document in the 428, 429 and 430 document suite.

## 4 Minimal Empty 428-7 Document

A complete D-Cinema Subtitle document should be created as per SMPTE ST 428-7 along with the constraints defined in SMPTE ST 429-2. The D-Cinema subtitle document shall contain the set of elements which define the global parameters. This element set, in addition, the values for `ContentTitleText`, `Language`, `EditRate`, `TimeCodeRate`, and `DisplayType` are to be contiguous with all D-Cinema Subtitle document instances that are referenced by the CPL. The elements of the document shall adhere to the additional constraints as outlined in the following sections.

### 4.1. ReelNumber

The value for the `ReelNumber` element shall match the corresponding reel element placement where the intended track file is to be referenced from the Composition Playlist XML. e.g., CPL `ReelList > Reel` array index [0] will equal Reel 01.

## 4.2. StartTime

The `StartTime` value shall be 00:00:00:00

## 4.3. LoadFont

When a `Text` element is present, the `LoadFont` element shall reference a Font file that contains no glyphs with the exception of those in Table 1 – Allowed Glyphs.

**Table 1 - Allowed Glyphs**

Glyph ID	Glyph Name	Unicode Value
0	.nodef	undefined
1	.null	U+0000
2	CR	U+000D
3	Space	U+0020

## 4.4. SubtitleList

The `SubtitleList` element shall have a single child `Font` element with no attributes.

## 4.5. Subtitle

The `Subtitle` element shall only have the `TimeIn` and `TimeOut` attributes.

### 4.5.1. TimeIn

The `TimeIn` attribute value shall be 00:00:01:ZeroE unless the instance is to be the composition's first Timed Text event whereby the value shall be 00:00:04:ZeroE.

### 4.5.2. TimeOut

The `TimeOut` attribute value shall be equal to the `TimeIn` attribute value + 15E

## 4.6. Text

The `Text` element shall have no attributes, and shall have a value equal to an empty string ("").

## 4.7. Image

The `Image` element shall reference a single auxiliary Portable Network Graphics [PNG] image resource acting as a sub-picture overlay as per Section 8.4.3 in SMPTE ST 429-2. Said resource, in its entirety, shall be transparent.

To avoid the use of full image PNG files, the image size shall be limited to a maximum of 128x128 pixels.

## 5 Timed Text Track File Constraints

All constraints defined in Section 10.4 Timed Text Track Files of SMPTE ST 429-2 shall be observed.

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## Annex A D-Cinema Subtitle Document example (Informative)

### A.1 Example using the Text Element

The following sample XML structure showcases a valid instance of the `SubtitleReel` schema using the `Text` element that allows the carriage of no textual data.

```
<?xml version="1.0" encoding="UTF-8"?>
<!--    *** Frame Rate 24 ***-->
<!--    *** urn:uuid:e7c646ab-2468-4fc8-8188-ee667aa81967 ***-->
<SubtitleReel xmlns="http://www.smp-te-ra.org/schemas/428-7/2014/DCST">
  <Id>urn:uuid:e7c646ab-2468-4fc8-8188-ee667aa81967</Id>
  <ContentTitleText>MyTitle</ContentTitleText>
  <IssueDate>2020-11-03T11:22:57-00:00</IssueDate>
  <ReelNumber>1</ReelNumber>
  <Language>en</Language>
  <EditRate>24 1</EditRate>
  <TimeCodeRate>24</TimeCodeRate>
  <StartTime>00:00:00:00</StartTime>
  <DisplayType>MainSubtitle</DisplayType>
  <LoadFont ID="Arial">urn:uuid:232c45d8-fde8-4e5e-86b9-86e96354daf3</LoadFont>
  <SubtitleList>
    <Font>
      <Subtitle TimeIn="00:00:04:00" TimeOut="00:00:04:15">
        <Text></Text>
      </Subtitle>
    </Font>
  </SubtitleList>
</SubtitleReel>
```



## A.2 Example using the Image Element

The following sample XML structure showcases a valid instance of the `SubtitleReel` schema using the `Image` element referencing a single PNG image resource which is transparent in its entirety.

```
<?xml version="1.0" encoding="UTF-8"?>
<!--    *** Frame Rate 24 ***-->
<!--    *** urn:uuid: 1d4fc9bb-beda-4385-bde1-49b15606e723 ***-->
<SubtitleReel xmlns="http://www.smp-te-ra.org/schemas/428-7/2014/DCST">
  <Id>urn:uuid:1d4fc9bb-beda-4385-bde1-49b15606e723</Id>
  <ContentTitleText>MyTitle</ContentTitleText>
  <IssueDate>2020-11-03T11:07:39-00:00</IssueDate>
  <ReelNumber>1</ReelNumber>
  <Language>en</Language>
  <EditRate>24 1</EditRate>
  <TimeCodeRate>24</TimeCodeRate>
  <StartTime>00:00:00:00</StartTime>
  <DisplayType>MainSubtitle</DisplayType>
  <SubtitleList>
    <Font>
      <Subtitle TimeIn="00:00:04:00" TimeOut="00:00:04:15">
        <Image>urn:uuid:d6a2902f-6a7c-4d9b-afa8-85d27089dffa</Image>
      </Subtitle>
    </Font>
  </SubtitleList>
</SubtitleReel>
```

## Annex B OSS Tool (Informative)

An open-source tool is provided at <https://github.com/jack-watts/empty-tt> for education and testing purposes.

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## Bibliography (Informative)

SMPTE, RDD 52:2020 “D-Cinema Packaging — SMPTE DCP Bv2.1 Application Profile”

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