

# ISDCF Doc 16: SMPTE ST 428-7 D-Cinema Timed Text Track File - Minimal Empty Document Requirements

## Table of Contents

Table of Contents.....	1
1. PURPOSE.....	1
2. Minimal Empty 428-7 Document.....	2
2.1. ReelNumber .....	2
2.2. StartTime.....	2
2.3. LoadFont .....	2
2.4. SubtitleList .....	2
2.5. Subtitle.....	2
2.5.1. TimeIn .....	2
2.5.2. TimeOut.....	2
2.6. Text.....	2
2.7. Image .....	2
3. Timed Text Track File Constraints .....	2
ANNEX 1 D-Cinema Subtitle Document example (Informative).....	3
A1.1. Example using the Text Element.....	3
A1.2. Example using the Image Element.....	3
ANNEX 2 OSS Tool (Informative) .....	4

## 1. PURPOSE

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 behaviour, 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” Timed Text asset track.

## 2. Minimal Empty 428-7 Document

A complete D-Cinema Subtitle document should be created as per SMPTE ST 428-7 along with the additional constraints defined in SMPTE ST 429-17, SMPTE ST 429-2, and SMPTE RDD 52. 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.

### 2.1. 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.

### 2.2. StartTime

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

### 2.3. LoadFont

The `LoadFont` element shall reference a Font file that contains no character sets.

### 2.4. SubtitleList

The `SubtitleList` element shall have single child `Font` element with no attributes that has a single `Subtitle` element containing one `Text` element with no attributes (closed tag) as its only child reference.

### 2.5. Subtitle

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

#### 2.5.1. 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.

#### 2.5.2. TimeOut

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

### 2.6. Text

The `Text` element shall have no attributes, be NULL and may be represented as a closed tag.

### 2.7. Image

The `Image` element shall reference a single auxiliary Portable Network Graphics [PNG] image resource acting as a sub-picture overlay as per Section 6.2 in SMPTE ST 428-7. Said resource, in its entirety, shall be transparent.

## 3. Timed Text Track File Constraints

All constraints defined in Section 10.4 Timed Text rack Files of RDD 52 shall be observed.

## ANNEX 1 D-Cinema Subtitle Document example (Informative)

### A1.1. 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.smpte-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>
```

### A1.2. 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.smpte-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 2 OSS Tool (Informative)**

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