SMPTE REGISTERED DISCLOSURE DOCUMENT

MDA D-Cinema Application

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1 Scope

This document specifies an application of the MDA Program specification 1.03 and MDA Bitstream specification 1.03 for D-Cinema applications.

2 Normative Reference

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

SMPTE ST 428-12:2013, D-Cinema Distribution Master Common Audio Channels and Soundfield Groups

3 MDA Program Constraints

3.1 Header.sampleRate

The value of the `Header.sampleRate` property shall be `<48000Sampling>` as specified in MDA Program Specification.

3.2 RenderingException.targetConfiguration

`RenderingException.targetConfiguration` MAY be a Soundfield Group as specified in SMPTE ST 428-12 (see Table 1).

3.3 RenderingException.ChannelGain.channel

`RenderingException.ChannelGain.channel` MAY be an Audio Channel as specified in SMPTE ST 428-12.

`RenderingException.ChannelGain.channel` SHALL NOT be an LFE channel.

3.4 LFEFragment

There SHALL be only one LFE object, i.e. only one entity ID associated with `LFEFragment` instances.

3.5 Group

An MDA Group SHALL only appears at top level (i.e. no recursion).

3.6 Switch

Switch instance(s) SHALL NOT be present.

3.7 Object Fragment Position

If present, `ObjectFragment.position.radius` SHALL be equal to 1.

All other values SHALL be reserved.

3.8 Object Fragment Coherent

If present, `ObjectFragment.coherent` SHALL be equal to 1.

4 Bitstream Constraints

4.1 Frames

Frames SHALL contain at least one Slice.

4.2 MonoSourceFragmentPacket.assetURI

The format for `MonoSourceFragmentPacket.assetURI` for external assets (i.e. mainsound channels) SHALL be `"urn:x-mda:mainsound-label:" + channelLabel`, where `channelLabel` is a channel name as defined in SMPTE ST 428-12 (see also Table 2).

4.3 MonoSourceFragmentPacket.offset

A mainsound channel is interpreted as a PCM wave file starting at the beginning of the MDA Program. For external assets the `MonoSourceFragmentPacket.assetOffset` property SHALL be relative to the beginning of aforementioned wave file, and therefore relative to the beginning of the MDA Program.

5 MDA Reference Renderer Constraints

5.1 Configuration.soundFieldName

A `Configuration.soundnameField` field MAY be a Soundfield Group as specified in SMPTE ST 428-12 (see also Table 1). Local labels are not used in this version of the MDA Bitstream Specification.

Table 1 – Allowed soundfieldName Values

URI	Symbol	Local Label
urn:smpte:ul:060E2B34.0401010D.03020201.00000000	51	{0, 0x01}
urn:smpte:ul:060E2B34.0401010D.03020202.00000000	71	{0, 0x02}

5.2 Configuration.speakers

`Configuration.speakers[n]` MAY be an Audio Channel as specified in SMPTE ST 428-12 (see first column in Table 2).

The second column in Table 2 lists the more commonly short names for the speakers.

Local labels are not used for this version of the specification.

Table 2 – Allowed Speaker Names

URI	Symbol	Local Label
urn:smpte:ul:060E2B34.0401010D.03020101.00000000	L	{0, 0x01}
urn:smpte:ul:060E2B34.0401010D.03020102.00000000	R	{0, 0x02}
urn:smpte:ul:060E2B34.0401010D.03020103.00000000	C	{0, 0x03}
urn:smpte:ul:060E2B34.0401010D.03020104.00000000	LFE	{0, 0x04}
urn:smpte:ul:060E2B34.0401010D.03020105.00000000	Ls	{0, 0x05}
urn:smpte:ul:060E2B34.0401010D.03020106.00000000	Rs	{0, 0x06}
urn:smpte:ul:060E2B34.0401010D.03020107.00000000	Lss	{0, 0x07}
urn:smpte:ul:060E2B34.0401010D.03020108.00000000	Rss	{0, 0x08}
urn:smpte:ul:060E2B34.0401010D.03020109.00000000	Lrs	{0, 0x09}
urn:smpte:ul:060E2B34.0401010D.0302010A.00000000	Rrs	{0, 0x0A}

6 Cinema Extensions

6.1 BedTags

A `BedTagsExtension` is attached to an Entity and signals to qualified asset extraction tools that the audio essence associated with this Entity is available for extraction to main sound. After extraction, the `assetURI` within the bitstream SHALL conform to Section 4.2.

Note that Objects may be rendering excepted, without having an associated BedTags extension.

Table 3 – BedTags Extension

```
struct mdaBedTagsExtension : Extension {

  fName = kBedTagsExtensionName;

  FixedArray<UTF8String>)   soundFields;

}
```

The following constraints apply:

1. BedTags Extensions only apply to Object Fragments and LFE Fragments and are ignored for other Entities.
2. BedTags Extensions are static for the duration of the MDA Program: for every Entity with the same ID, a BedTags Extension is either applied to all Entities with that ID or to none at all.

3. The soundfields within a BedTags extension SHALL be one of as listed in SMPTE ST 428-12 (see Table 1.

4. An Object with a BedTags Extension for `soundField`=X, shall have a Channel Rendering Exception for that same sound field X, and shall be addressing a single channel C only, static for the duration of the MDA Program.

5. BedTags Extension shall be complete and unique within an MDA Program: if a BedTags Extension for `soundField`=X is present in an MDA Program, then there exists precisely one Object Fragment / LFE Fragment ID for every channel within the sound field.

Table 4 – BedTags Extension Name

Constant	URI
kBedTagsExtensionName	<mdaroot>/1.0/extension/bed-tags