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**CODING OF MOVING PICTURES AND AUDIO**

**ISO/IEC JTC 1/SC 29/WG 3 N1117**

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# Scope

This document provides a working draft for ISO/IEC 13818-1 9th edition Amd. 1, "Codec parameter clarifications and other improvements".

This Amendment clarifies the usage of certain codec parameters and improves the definition of certain program element descriptors, assuring the proper application of the standard.

# Problem description(s)

## Codecs parameter layer signaling

The optional 'codecs' parameter as documented in Annex T.4.2 can be used to indicate one or more codecs which are used for the elementary streams in the MPEG-2 TS. Each codec parameter follows a clearly defined pattern where different elements are separated with a dot symbol. The third element separated with the dot symbol can be used to represent the signalling of the 2 bit audio layer and the specification refers to the section 2.6.4 for its definition.

“When the first element of a value is 'mp1a.6B' (ISO/IEC 11172-3), or 'mp2a.069' (i.e., ISO/IEC 13818-3), the third element of the codecs parameter value is the hexadecimal representation of the 2-bit layer, as defined in 2.6.4.”

The section 2.6.4 specifies the audio\_stream\_descriptor including the 2 bit layer field which is pointing to the definition in ISO/IEC 11172-3 where the layer is signalled as follows:

Table

Description automatically generated

Figure 1: Layer definition from ISO/IEC 11172-3 § 2.4.2.3.   
The value 3 (‘11’) is used to signal Layer I while the value 1 (‘01’) is used to signal Layer III.

As can be seen from the Figure 1 the binary representation of the layer is inverted. The problem with this is that this inversion makes the interpretation very ambiguous. Especially given the fact that the provided example in Annex T.4.2 also interprets it wrong.

ISO/IEC 11172-3 layer 3 is represented

video/mp2ts;codecs="mp2a.6B.03"

In addition to that, the [RFC3555](https://www.rfc-editor.org/rfc/rfc3555.html) which is referred by IANA for the ([video/mp2t](https://www.iana.org/assignments/media-types/media-types.xhtml)) mime type registration also refers to MPEG audio layers as 1, 2, 3 without any further clarifications on the inversion aspect. Therefore, it is very unlikely that implementers will interpret the signaling correctly as we cannot expect everyone to follow the layer definition up to the ISO/IEC 11172-3.

Therefore, it would be highly desirable to clarify the Annex T 4.2 to make it clear that the level element in the codec parameter is not inverted and that the signaling of .01 represents Layer I and .03 represents Layer III.

## Further bugfixes

Optional parameters:

The 'profiles' parameter as documented in T.4.1

The 'codecs' parameter as documented in T.4.2

…

## Examples:

ISO/IEC 13818-2 Main Profile

video/mp2t;codecs="mp2v.61"

ISO/IEC 11172-3 layer 3 is represented

video/mp2t;codecs="mp1a.6B.03"

ISO/IEC 13818-3 layer 2 is represented

video/mp2t;codecs="mp2a.69.02"

ISO/IEC 13818-7 Low Complexity Profile

video/mp2t;codecs="mp2a.67"

Dolby AC-3 audio (per ATSC A/52, AC-3 audio has stream\_type 0x81 and format\_identifier "AC-3" in the registration\_descriptor )

video/mp2t;codecs="ac-3"

ISO/IEC 13818-2 Main Profile Video together with ISO/IEC 13818-7 audio

video/mp2t;codecs="mp2v.61,mp2a.67"

## MPEG-H 3D audio descriptor

The field c*ompatibleSetIndication* specified in 2.6.106 and 2.6.107 should start with a lowercase letter.

## MPEG-H 3D audio scene descriptor

The syntax in 2.6.110 initially defines three 'Present' flags - groupDefinitionPresent, switchGroupDefinitionPresent and groupPresetDefinitionPresent, however four 'Present' flags are described in the semantic definition in 2.6.111. The *groupContentDataPresent* definition should be removed.

The syntax in 2.6.110 initially defines the groupPresetDefinitionPresent but later in the syntax (and in the semantics), *presetGroupDefinitionPresent* is used. Occurrences of *presetGroupDefinitionPresent* within the syntax and semantics should be replaced withgroupPresetDefinitionPresent.

The syntax defines the mae\_numGroupPresetConditions element, but the semantic definition use *mae\_groupPresetNumConditions*. The two instances in the syntax (element definition and use in the for loop) should be corrected. Futhermore, it should be clarified that mae\_groupPresetNumConditionsrefers tomae\_bsGroupPresetNumConditionsin ISO/IEC 23008-3.

The syntax and semantics in 2.6.110 resp. 2.6.111 define and use the field mae\_groupPresetGroupID and reference ISO/IEC 23008-3 for its exact definition. In ISO/IEC 23008-3 this field is called mae\_groupPresetReferenceID, therefore the name of the field should be aligned to ISO/IEC 23008-3.

## MPEG-H 3D audio multi-stream descriptor

The semantics for fields *thisStreamID* and *auxiliaryStreamID* specified in 2.6.115 need some clarification.

**References**

1. ISO/IEC JTC 1/SC 29/WG 3 m62551, *MPEG2TS codec parameter clarifications and Annex T bugfixes* by Dimitri Podborski, Kevin Calhoun (Apple Inc.)
2. ISO/IEC JTC 1/SC 29/WG 3 m65859, *Defect Report for MPEG-H descriptors in MPEG-2 TS* by Moritz Fuchs, Bernd Czelhan, Ingo Hofmann (Fraunhofer IIS)

# Proposed text in “amendment style”

*<<Ed: Proposed changes are marked in yellow in the working draft; highlighting will be removed in final amendment text>>.*

Information technology – Generic coding of moving pictures and associated audio information: Systems

Amendment 1  
  
Codec parameter clarifications and other improvements

# 1) Clause 2.6.106

*Replace 2.6.106 with:*

### **2.6.106 MPEG-H 3D audio descriptor**

The MPEG-H 3D audio descriptor (see Table 2-121) provides information on basic coding information in the associated ISO/IEC 23008-3 stream. This descriptor shall be present in the associated PMT for MPEG-H 3D audio content with stream\_type equal to 0x2D.

Table 2-121 – MPEG-H 3D audio descriptor

|  |  |  |  |
| --- | --- | --- | --- |
| Syntax | No. of bits | Mnemonic | |
| MPEG-H\_3dAudio\_descriptor() { |  |  | |
| **mpegh3daProfileLevelIndication** | **8** | **uimsbf** | |
| **interactivityEnabled** | **1** | **bslbf** | |
| **compatibleProfileSetsPresent** | **1** | **bslbf** |
| **reserved** | **8** | **bslbf** | |
| **referenceChannelLayout** | **6** | **uimsbf** | |
| if (compatibleProfileSetsPresent == '0') { |  |  | |
| **numCompatibleSets** | **8** | **uimsbf** | |
| for ( n = 0; n < numCompatibleSets; n++ ) { |  |  | |
| **compatibleSetIndication** | **8** | **uimsbf** | |
| } |  |  | |
| } |  |  | |
| for (i=0; i<N; i++) { |  |  | |
| **reserved** | **8** | **bslbf** | |
| } |  |  | |
| } |  |  | |

# 2) Clause 2.6.107

*In 2.6.107, replace*

**CompatibleSetIndication** – See CompatibleSetIndication field in the CompatibleProfileLevelSet() config extension in ISO/IEC 23008-3.

*with:*

**compatibleSetIndication** – See CompatibleSetIndication field in the CompatibleProfileLevelSet() config extension in ISO/IEC 23008-3.

# 3) Clause 2.6.110

*Replace 2.6.110 with:*

### **2.6.110 MPEG-H 3D audio scene descriptor**

The MPEG-H 3D audio scene descriptor (see Table 2-123) provides information on user selectable and/or modifiable audio objects in an ISO/IEC 23008-3 stream.

| Table 2-123 – MPEG-H 3D audio scene descriptor | | |
| --- | --- | --- |
| Syntax | No. of bits | Mnemonic |
| MPEG-H\_3dAudio\_scene\_descriptor() { |  |  |
| **groupDefinitionPresent** | **1** | **bslbf** |
| **switchGroupDefinitionPresent** | **1** | **bslbf** |
| **groupPresetDefinitionPresent** | **1** | **bslbf** |
| **reserved** | **5** | **bslbf** |
|  |  |  |
| **3dAudioSceneInfoID** | **8** | **bslbf** |
|  |  |  |
| if (groupDefinitionPresent) { |  |  |
| **reserved** | **1** | **bslbf** |
| **numGroups** | **7** | **uimsbf** |
| for ( i=0; i < numGroups; i++) { |  |  |
| **reserved** | **1** | **bslbf** |
| **mae\_groupID** | **7** | **uimsbf** |
| **reserved** | **3** | **bslbf** |
| **mae\_allowOnOff** | **1** | **bslbf** |
| **mae\_defaultOnOff** | **1** | **bslbf** |
| **mae\_allowPositionInteractivity** | **1** | **bslbf** |
| **mae\_allowGainInteractivity** | **1** | **bslbf** |
| **mae\_hasContentLanguage** | **1** | **bslbf** |
| **reserved** | **4** | **bslbf** |
| **mae\_contentKind** | **4** | **uimsbf** |
| if ( mae\_allowPositionInteractivity ) { |  |  |
| **reserved** | **1** | **bslbf** |
| **mae\_interactivityMinAzOffset** | **7** | **uimsbf** |
| **reserved** | **1** | **bslbf** |
| **mae\_interactivityMaxAzOffset** | **7** | **uimsbf** |
| **reserved** | **3** | **bslbf** |
| **mae\_interactivityMinElOffset** | **5** | **uimsbf** |
| **reserved** | **3** | **bslbf** |
| **mae\_interactivityMaxElOffset** | **5** | **uimsbf** |
| **mae\_interactivityMinDistOffset** | **4** | **uimsbf** |
| **mae\_interactivityMaxDistOffset** | **4** | **uimsbf** |
| } |  |  |
| if ( mae\_allowGainInteractivity ) { |  |  |
| **reserved** | **2** | **bslbf** |
| **mae\_interactivityMinGain** | **6** | **uimsbf** |
| **reserved** | **3** | **bslbf** |
| **mae\_interactivityMaxGain** | **5** | **uimsbf** |
| } |  |  |
| if ( mae\_hasContentLanguage ) { |  |  |
| **mae\_contentLanguage** | **24** | **uimsbf** |
| } |  |  |
| } |  |  |
| } |  |  |
|  |  |  |
| if (switchGroupDefinitionPresent) { |  |  |
| **reserved** | **3** | **bslbf** |
| **numSwitchGroups** | **5** | **uimsbf** |
| for ( i=0; i < numSwitchGroups; i++) { |  |  |
| **reserved** | **1** | **bslbf** |
| **mae\_switchGroupID** | **5** | **uimsbf** |
| **mae\_switchGroupAllowOnOff** | **1** | **bslbf** |
| **mae\_switchGroupDefaultOnOff** | **1** | **bslbf** |
| **reserved** | **3** | **bslbf** |
| **mae\_bsSwitchGroupNumMembers** | **5** | **uimsbf** |
| for ( i = 0; i < mae\_bsSwitchGroupNumMembers + 1; i++ ) { |  |  |
| **reserved** | **1** | **bslbf** |
| **mae\_switchGroupMemberID** | **7** | **uimsbf** |
| } |  |  |
| **reserved** | **1** | **bslbf** |
| **mae\_switchGroupDefaultGroupID** | **7** | **uimsbf** |
| } |  |  |
| } |  |  |
|  |  |  |
| if (groupPresetDefinitionPresent) { |  |  |
| **reserved** | **3** | **bslbf** |
| **mae\_numGroupPresets** | **5** | **uimsbf** |
| for ( i = 0; i < mae\_numGroupPresets; i++ ) { |  |  |
| **reserved** | **3** | **bslbf** |
| **mae\_groupPresetID** | **5** | **uimsbf** |
| **reserved** | **3** | **bslbf** |
| **mae\_groupPresetKind** | **5** | **uimsbf** |
| **reserved** | **4** | **bslbf** |
| **mae\_groupPresetNumConditions** | **4** | **uimsbf** |
| for ( j = 0; j < mae\_groupPresetNumConditions +1; j++ ) { |  |  |
| **mae\_groupPresetReferenceID** | **7** | **uimsbf** |
| **mae\_groupPresetConditionOnOff** | **1** | **bslbf** |
| if (mae\_groupPresetConditionOnOff ) { |  |  |
| **reserved** | **4** | **bslbf** |
| **mae\_groupPresetDisableGainInteractivity** | **1** | **bslbf** |
| **mae\_groupPresetGainFlag** | **1** | **bslbf** |
| **mae\_groupPresetDisablePositionInteractivity** | **1** | **bslbf** |
| **mae\_groupPresetPositionFlag** | **1** | **bslbf** |
| if ( mae\_groupPresetGainFlag ) { |  |  |
| **mae\_groupPresetGain** | **8** | **uimsbf** |
| } |  |  |
| if( mae\_groupPresetPositionFlag ){ |  |  |
| **mae\_groupPresetAzOffset** | **8** | **uimsbf** |
| **reserved** | **2** | **bslbf** |
| **mae\_groupPresetElOffset** | **6** | **uimsbf** |
| **reserved** | **4** | **bslbf** |
| **mae\_groupPresetDistFactor** | **4** | **uimsbf** |
| } |  |  |
| } |  |  |
| } |  |  |
| } |  |  |
| } |  |  |
|  |  |  |
| for (i=0; i<N; i++) { |  |  |
| **reserved** | **8** | **bslbf** |
| } |  |  |
| } |  |  |

# 4) Clause 2.6.111

*In 2.6.111, replace*

**groupDefinitionPresent** – A one-bit flag signalling the presence of interactivity information of one group in this descriptor.

**groupContentDataPresent** – A one-bit flag signalling the presence of content information of one group in this descriptor.

**switchGroupDefinitionPresent** – A one-bit flag signalling the presence of switch group information in this descriptor.

**presetGroupDefinitionPresent** – A one-bit flag signalling the presence of preset group information in this descriptor.

*with*

**groupDefinitionPresent** – A one-bit flag signalling the presence of interactivity information of one group in this descriptor.

**switchGroupDefinitionPresent** – A one-bit flag signalling the presence of switch group information in this descriptor.

**groupPresetDefinitionPresent** – A one-bit flag signalling the presence of preset group information in this descriptor.

*Further replace*

**mae\_groupPresetNumConditions** – See 15.3 of ISO/IEC 23008-3.

**mae\_groupPresetGroupID** – See 15.3 of ISO/IEC 23008-3.

*with*

**mae\_groupPresetNumConditions** – See mae\_bsGroupPresetNumConditions in 15.3 of ISO/IEC 23008-3.

**mae\_groupPresetReferenceID** – See 15.3 of ISO/IEC 23008-3.

# 5) Clause 2.6.115

*Replace in 2.6.115*

**thisStreamID** – This integer provides a unique ID of all available ISO/IEC 23008-3 Audio streams with MHAS transport syntax, both main and auxiliary streams (stream\_type 0x2D and 0x2E).

*with:*

**thisStreamID** – This integer provides a unique ID for the ISO/IEC 23008-3 Audio stream with MHAS transport syntax this descriptor refers to (both main and auxiliary streams with stream\_type 0x2D and 0x2E).

*Further replace*

**auxiliaryStreamID** – In case of transmission of encoded audio data as identified by groupID in an auxiliary stream, this integer identifies the used auxiliary stream.

*with:*

**auxiliaryStreamID** – In case of transmission of encoded audio data as identified by mae\_groupID in an auxiliary stream, this integer identifies the used auxiliary stream.

# 6) Annex T

*In clause T.2, replace*

Optional parameters:  
 The 'profiles' parameter as documented in T.2.1

The 'codecs' parameter as document in T.2.2

*with:*

Optional parameters:  
 The 'profiles' parameter as documented in T.4.1

The 'codecs' parameter as document in T.4.2

*In clause T.4, replace*

When the first element of a value is 'mp1a.6B' (ISO/IEC 11172-3), or 'mp2a.069' (i.e., ISO/IEC 13818-3), the third element of the codecs parameter value is the hexadecimal representation of the 2-bit layer, as defined in 2.6.4.

Examples:

ISO/IEC 13818-2 Main Profile

video/mp2ts;codecs="mp2v.61"

ISO/IEC 11172-3 layer 3 is represented

video/mp2ts;codecs="mp2a.6B.03"

ISO/IEC 13818-3 layer 2 is represented

video/mp2ts;codecs="mp2a.69"

*with:*

When the first element of a value is 'mp1a.6B' (ISO/IEC 11172-3), or 'mp2a.069' (i.e., ISO/IEC 13818-3), the third element of the codecs parameter value is the hexadecimal representation of the 2-bit layer, as indicated by the layer field of the audio stream descriptor defined in 2.6.4 and 2.6.5. The third element shall correspond to Layer number (in contrast to its binary representation in the descriptor), i.e. if the third element of the codecs parameter is 01, this corresponds to Layer I (as specified in ISO/IEC 11172-3), and if the third element is 03, this corresponds to Layer III.

Examples:

ISO/IEC 13818-2 Main Profile

video/mp2ts;codecs="mp2v.61"

ISO/IEC 11172-3 layer III is represented

video/mp2ts;codecs="mp1a.6B.03"

ISO/IEC 13818-3 layer II is represented

video/mp2ts;codecs="mp2a.69.02"