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AMENDMENT 3
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**Information technology — Generic coding
of moving pictures and associated audio
information: Video**

AMENDMENT 3

*Technologies de l'information — Codage générique des images animées et
du son associé: Données vidéo*

AMENDEMENT 3



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Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work.

In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1. Draft International Standards adopted by the joint technical committee are circulated to national bodies for voting. Publication as an International Standard requires approval by at least 75 % of the national bodies casting a vote.

Amendment 3 to ISO/IEC 13818-2:1996 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 29, *Coding of audio, picture, multimedia and hypermedia information*, in collaboration with ITU-T. The identical text is published as ITU-T Rec. H.262/Amd.3.

INTERNATIONAL STANDARD

ITU-T RECOMMENDATION

INFORMATION TECHNOLOGY – GENERIC CODING OF MOVING
PICTURES AND ASSOCIATED AUDIO INFORMATION: VIDEO

AMENDMENT 3

1) Subclause 6.2.2.2.1

Replace 6.2.2.2.1 by the following:

6.2.2.2.1 Extension data

extension_data(i) {	No. of bits	Mnemonic
while (nextbits() == extension_start_code) {		
extension_start_code	32	bslbf
if (i == 0) { /* follows sequence_extension() */		
if (nextbits() == "Sequence Display Extension ID")		
sequence_display_extension()		
else if (nextbits()		
== "Sequence Scalable Extension ID")		
sequence_scalable_extension()		
}		
/* NOTE – i never takes the value 1 because extension_data()		
never follows a group_of_pictures_header() */		
if (i == 2) { /* follows picture_coding_extension() */		
if (nextbits() == "Quant Matrix Extension ID")		
quant_matrix_extension()		
else if (nextbits() == "Copyright Extension ID")		
copyright_extension()		
else if (nextbits() == "Picture Display Extension ID")		
picture_display_extension()		
else if (nextbits()		
== "Picture Spatial Scalable Extension ID")		
picture_spatial_scalable_extension()		
else if (nextbits()		
== "Picture Temporal Scalable Extension ID")		
picture_temporal_scalable_extension()		
else if (nextbits()		
== "Camera Parameters Extension ID")		
camera_parameters_extension()		
}		
}		

2) Subclause 6.3.1

Replace Table 6-2 by:

Table 6-2 – extension_start_code_identifier codes

extension_start_code_identifier	Name
0000	Reserved
0001	Sequence Extension ID
0010	Sequence Display Extension ID
0011	Quant Matrix Extension ID
0100	Copyright Extension ID
0101	Sequence Scalable Extension ID
0110	Reserved
0111	Picture Display Extension ID
1000	Picture Coding Extension ID
1001	Picture Spatial Scalable Extension ID
1010	Picture Temporal Scalable Extension ID
1011	Camera Parameters Extension ID
1100	Reserved
...	...
1111	Reserved

3) New subclause 6.2.3.7.1

Insert new subclause 6.2.3.7.1:

6.2.3.7.1 Camera parameters extension

camera_parameters_extension() {	No. of bits	Mnemonic
extension_start_code_identifier	4	uimsbf
reserved	1	uimsbf
camera_id	7	simsbf
marker_bit	1	bslbf
height_of_image_device	22	uimsbf
marker_bit	1	bslbf
focal_length	22	uimsbf
marker_bit	1	bslbf
f_number	22	uimsbf
marker_bit	1	bslbf
vertical_angle_of_view	22	uimsbf
marker_bit	1	bslbf
camera_position_x_upper	16	simsbf
marker_bit	1	bslbf
camera_position_x_lower	16	
marker_bit	1	bslbf
camera_position_y_upper	16	simsbf
marker_bit	1	bslbf
camera_position_y_lower	16	
marker_bit	1	bslbf
camera_position_z_upper	16	simsbf
marker_bit	1	bslbf
camera_position_z_lower	16	
marker_bit	1	bslbf
camera_direction_x	22	simsbf
marker_bit	1	bslbf
camera_direction_y	22	simsbf
marker_bit	1	bslbf
camera_direction_z	22	simsbf
marker_bit	1	bslbf
image_plane_vertical_x	22	simsbf
marker_bit	1	bslbf
image_plane_vertical_y	22	simsbf
marker_bit	1	bslbf
image_plane_vertical_z	22	simsbf
marker_bit	1	bslbf
reserved	32	bslbf
next_start_code()		
}		

4) New subclause 6.3.19

Insert new subclause 6.3.19:

6.3.19 Camera parameters extension

camera_id – The number in camera_id identifies a camera.

height_of_image_device – This is a 22-bit unsigned integer which specifies the height of image device. Its value shall be measured to a resolution of 0.001 millimeter and having a range of zero to 4,194.303 mm.

focal_length – This is a 22-bit unsigned integer which specifies the focal length. Its value shall be measured to a resolution of 0.001 millimeter and having a range of zero to 4,194.303 mm.

f_number – This is a 22-bit unsigned integer which specifies the F-number. F-number is defined by (focal_length)/(effective aperture of lens). Its value shall be measured to a resolution of 0.001 and having a range of zero to 4,194.303.

vertical_angle_of_view – This is a 22-bit unsigned integer which specifies the vertical angle of the field of view as determined between the top and bottom edges of the image device. Its value shall be measured to a resolution of 0.0001 degree and having a range of zero to 180 degrees.

camera_position_x_upper, camera_position_y_upper, camera_position_z_upper – These words constitute the 16 most significant bits of camera_position_x, camera_position_y and camera_position_z respectively.

camera_position_x_lower, camera_position_y_lower, camera_position_z_lower – These words constitute the 16 least significant bits of camera_position_x, camera_position_y and camera_position_z respectively.

camera_position_x, camera_position_y, camera_position_z – A set of these values specifies the position of the optical principal point of the camera in a user-specified world coordinate system. Each of these values shall be measured to a resolution of 0.001 millimeter and having a range of +2,147,483.647 mm to –2,147,483.648 mm. The camera_position_x is a 32-bit signed (two's complement) integer, the 16 least significant bits are defined in camera_position_x_lower, the 16 most significant bits are defined in camera_position_x_upper. The camera_position_y is a 32-bit signed (two's complement) integer, the 16 least significant bits are defined in camera_position_y_lower, the 16 most significant bits are defined in camera_position_y_upper. The camera_position_z is a 32-bit signed (two's complement) integer, the 16 least significant bits are defined in camera_position_z_lower, the 16 most significant bits are defined in camera_position_z_upper.

camera_direction_x, camera_direction_y, camera_direction_z – A set of these values specifies the direction of the camera. The direction of the camera is defined by using the vector from optical principal point to a point which is in front of the camera and is on the optical axis of the camera. Each of these values is a 22-bit signed (two's complement) integer and having a range of +2,097,151 to –2,097,152.

image_plane_vertical_x, image_plane_vertical_y, image_plane_vertical_z – A set of these values specifies the upper direction of the camera. The upper direction of the camera is defined by using the vector which is parallel to the side edge of the image device and is from bottom edge to top edge. Each of these values is a 22-bit signed (two's complement) integer and is having a range of +2,097,151 to –2,097,152.

Figures in Appendix I explain these terms pictorially.

5) **Clause 8**a) *Replace Table 8-4 by:***Table 8-4 – Escape profile_and_level_indication identification**

profile_and_level_indication	Name
10001111 to 11111111	(Reserved)
10001110	Multi-view profile @ Low level
10001101	Multi-view profile @ Main level
10001100	(Reserved)
10001011	Multi-view profile @ High1440 level
10001010	Multi-view profile @ High level
10000110 to 10001001	(Reserved)
10000101	4:2:2 profile @ Main level
10000000 to 10000100	(Reserved)

b) *Add the following text as a Note after the Note on 4:2:2 Profile (as indicated in Amendment 2); accordingly, the Note on 4:2:2 Profile shall be renamed "NOTE 1 – On 4:2:2 Profile ":*

NOTE 2 – On Multi-view Profile: The Multi-view Profile (MVP) is envisioned to be a profile appropriate for applications that require multiple viewpoints within the context of ITU-T Rec. H.262 | ISO/IEC 13818-2. MVP supports stereoscopic pictures as its source images for a wide range of picture resolution and quality as requested by the applications to be used. A base layer of MVP is assigned to a left view and an enhancement layer is assigned to a right view.

A monoscopic coding with the same tools as Main Profile (MP), including ISO/IEC IS 11172-2, is applied to the base layer. An enhancement layer is coded using Temporal Scalability tools and a hybrid prediction of motions and disparity can be utilized in the enhanced layer.

MVP, viewed as one of the scalable profiles in terms of multiple viewpoint layers, is expected to have the same type of compatibility features other scalable profiles have, such as compatibility with MP. For example:

- 1) decoders compliant to MVP at a certain Level are capable of decoding the bitstreams compliant to MP at the corresponding Level (i.e. forward compatibility);
- 2) decoders compliant to MP at a certain Level are capable of decoding the bitstream in the base layer of MVP (i.e. backward compatibility).