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Partie 7: Format de media de liaison JPEG (JLINK)

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Contents

Page

Foreword ... **iv**
Introduction ... **v**
1 Scope ... **1**
2 Normative references ... **1**
3 Terms and definitions ... **1**
4 Abbreviations ... **2**
5 General ... **2**
5.1 JLINK concept ... 2
5.2 Description of a user experience ... 3
6 Components of a scene ... **5**
6.1 Image ... 5
6.2 Viewport ... 5
6.3 Title and note ... 6
7 Components of a link ... **6**
7.1 Reference to a destination scene ... 6
7.2 Linkage region on 2D image of the source scene ... 6
7.3 Viewport ID on showing 2D image of the destination scene ... 8
8 Sprites ... **8**
9 Moving between scenes ... **8**
9.1 Jump-in effect ... 8
9.2 Jump-out effect ... 10
10 Structuring of JLINK metadata ... **12**
10.1 General ... 12
10.2 Definition of JUMBF content type for JLINK ... 12
10.3 Structure by JUMBF boxes for JLINK ... 12
10.4 File position for JLINK metadata and linked media ... 13
Annex A (normative) **JUMBF content type for JLINK** ... **15**
Annex B (normative) **Metadata for JLINK** ... **16**
Annex C (informative) **Example implementations for scene changes** ... **26**
Bibliography ... **30**

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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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives or www.iec.ch/members_experts/refdocs).

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This document was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 29, *Coding of audio, picture, multimedia and hypermedia information*.

A list of all parts in the ISO/IEC 19566 series can be found on the ISO and IEC websites.

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Introduction

This document describes the JPEG Linked Media Format (JLINK) international standard, which enables the embodiment of multiple image types and media elements into a single media content. This document elaborates on the inherent properties and functionalities of the file format, such as file structure and navigation.

This document defines the image container for structuring multiple types of media into a single file, including definition of metadata specification for multiple types of media. It supports legacy technology in the domain, such as image coding technology as well as metadata standards that signal access policies and others.

In this document, the following verbal forms are used:

— “shall” indicates a requirement;

— “should” indicates a recommendation;

— “may” indicates a permission;

— “can” indicates a possibility or a capability.

Information marked as “NOTE” is intended to assist the understanding or use of the document. “Notes to entry” used in Clause 3 provide additional information that supplements the terminological data and can contain provisions relating to the use of a term.

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Information technologies — JPEG systems —

Part 7:
JPEG linked media format (JLINK)

1 Scope

This document specifies an image file format capable of linking multiple media elements, such as image and text in any box-based JPEG file format.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO/IEC 19566-5, *Information technologies — JPEG systems — Part 5: JPEG universal metadata box format (JUMBF)*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

3.1
bitstream
sequence of bits comprising an image file

3.2
codestream
collection of one or more bit streams and the main header, tile-part headers, and the EOC required for their decoding and expansion into image data

Note 1 to entry: This is the image data in a compressed form with all of the signalling needed to decode.

[SOURCE: ISO/IEC 15444-1:2019, 3.19]

3.3
link
relational description of a scene to another scene composed of linkage region, sprite, and visual effect for scene change

3.4
linkage region
specific region in a source scene to which a link is active

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3.5
metadata
data about data

[SOURCE: ISO 19115:2003]

3.6
point of origin
reference location (e.g. 0,0) used to describe offset positions

3.7
scene
basic unit of a JLINK composed of a 2D image and text

3.8
sprite
visual element on the user display which indicates user interaction events

4 Abbreviations

FOV	field of view
JLINK	JPEG linked media format
JPEG	joint photographic experts group
JUMBF	JPEG universal metadata box format
URI	uniform resource identifier
XML	extensible markup language
XMP	extensible metadata platform
RDF	resource description framework
UMF	universal metadata framework

5 General

5.1 JLINK concept

JLINK structures sets of 2D images and text into a theme-related content. The basic elements of JLINK are a 'scene' and a 'link'. A scene contains 2D image (or portions thereof) and other elements such as an image title, an image note, and image viewports.

A link describes the way(s) scenes are associated, and it contains a description of interactive region of interest, overlaid sprites and their locations on the image, and visual effect between scene renderings. Combining scenes and links creates curated multimedia experience of the images.

Figure 1 shows a JLINK where scene0 has links to scene1 and scene3 and scene1 to scene2 (Figure 1). scene0 and scene1 have specific linkage regions to scene1, scene3, and scene2, respectively, with the location that originated from the top left (Figure 4).

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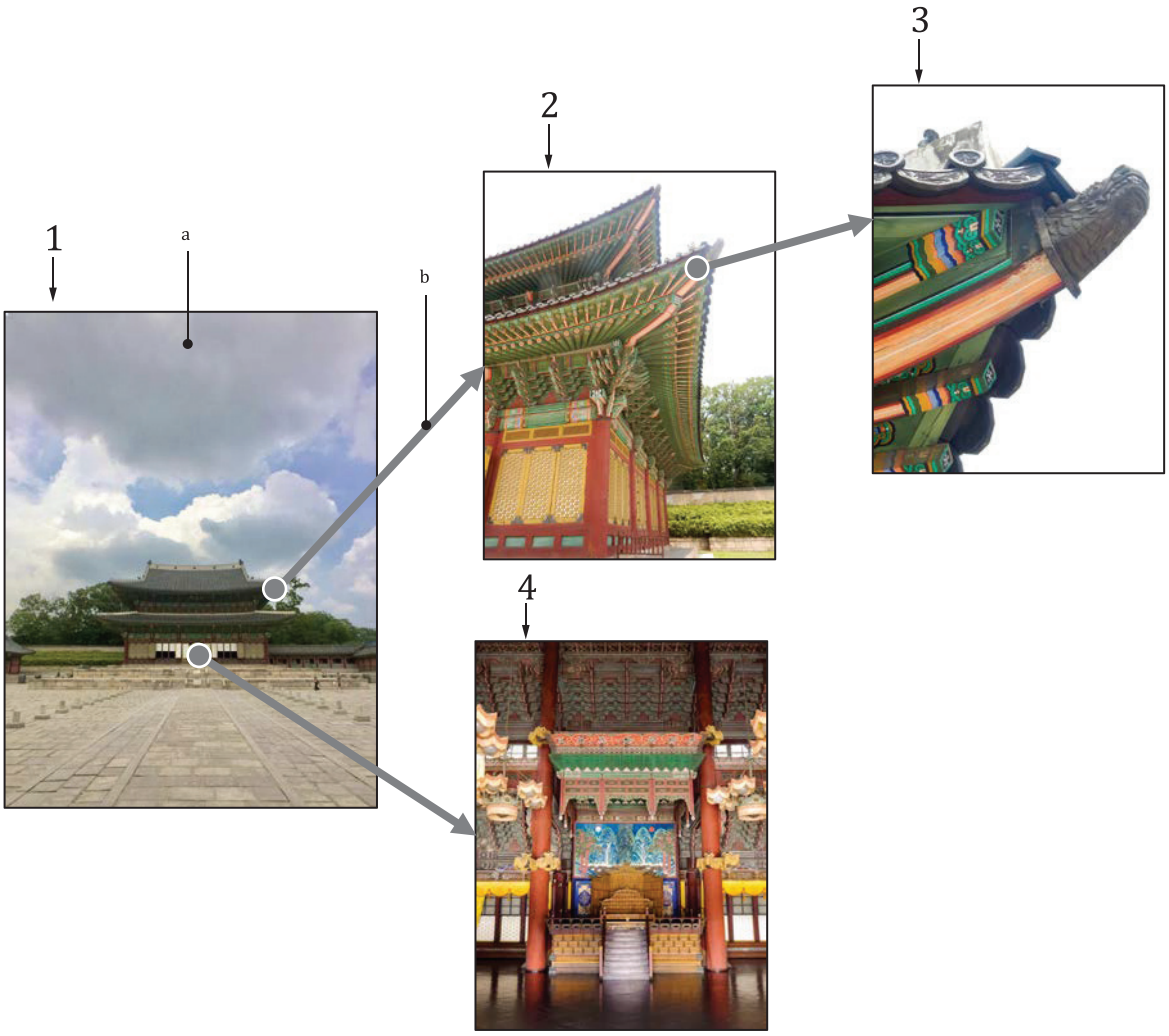

Key

1 scene0

2 scene1

3 Scene2

4 scene3

a A scene contains image, title, note, and viewports.

b A link contains linkage region, sprite, and scene change.

Figure 1 — An example of JLINK image with four linked scenes

5.2 Description of a user experience

As a typical usage example for the JLINK shown as Figure 1, a viewer software shall provide the following user experience (Figure 2):

a) Presentation of a scene and sprites

— An image of any scene (e.g., scene0) is presented to a viewport. When the presented scene (scene0) is linked to the other scenes (scene1 and scene2), the sprite corresponding to each link is placed at each linkage region (see 7.2) on the image of the presented scene.

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b) Selection of a sprite

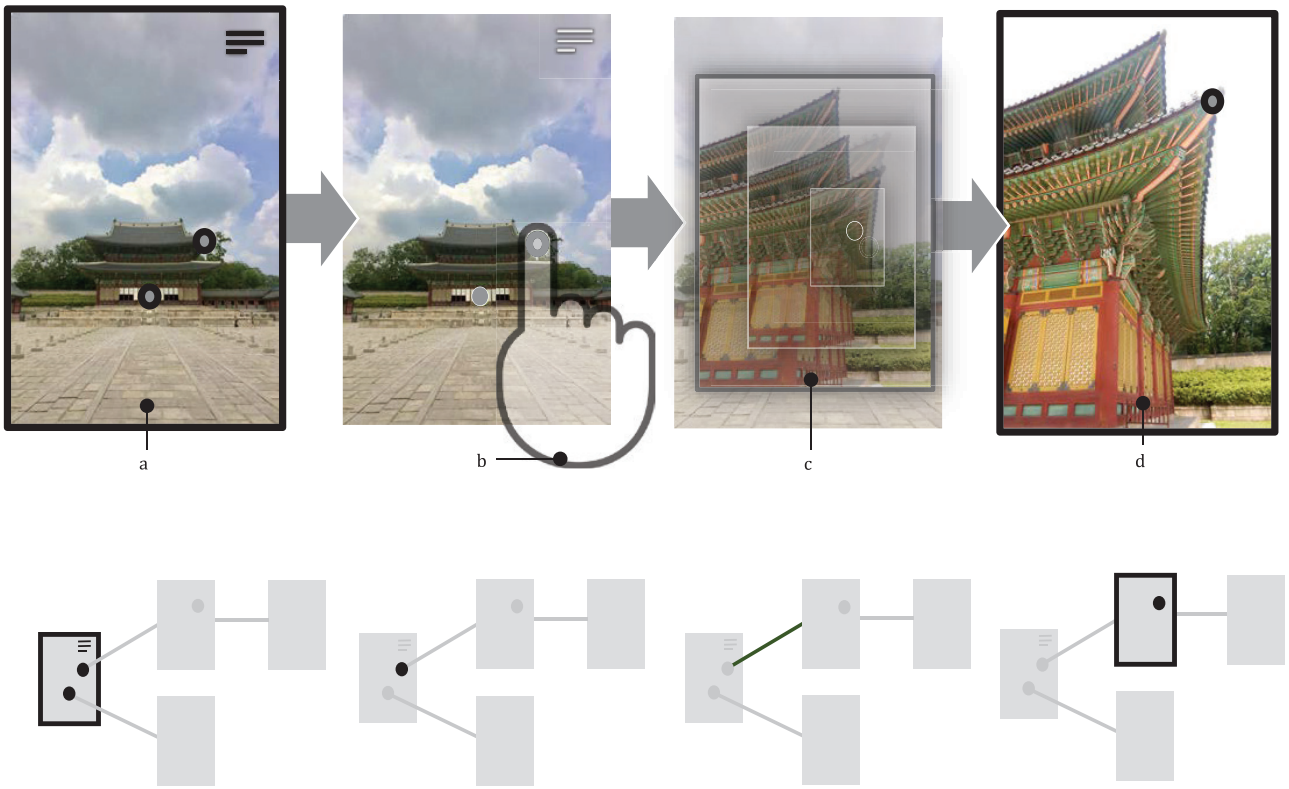
— Sprites placed on the scene receive user interface events. Image 2 in Figure 2 shows an example that one of the sprites receives a user interface event (selection).

c) Visual effect for scene change and preparing subsequent scene

— When a sprite receives a user interface event, the screen transitions to another scene (scene1) that is the destination of the corresponding link.

d) Presentation of the destination scene and sprites

— The image of the destination scene (scene1) is presented in the same way as described in '1. Presentation of a scene and sprites.'



a The viewer software presents a scene with sprite, title and note.

b The user selects a sprite.

c The viewer software presents the visual effect for scene change and preparing the destination scene.

d The viewer software presents the destination scene and sprites.

Figure 2 — An example of the JLINK user experience

As a typical usage example for title and note associated with a scene, a viewer software shall provide the following user experience (Figure 3).

a) Presentation of a scene with a title and note

— An image of any scene (scene0) is presented. When the presented scene has text information, *i.e.*, title or/and note, the viewer software places an icon (text button) on the scene to indicate that text information is available.

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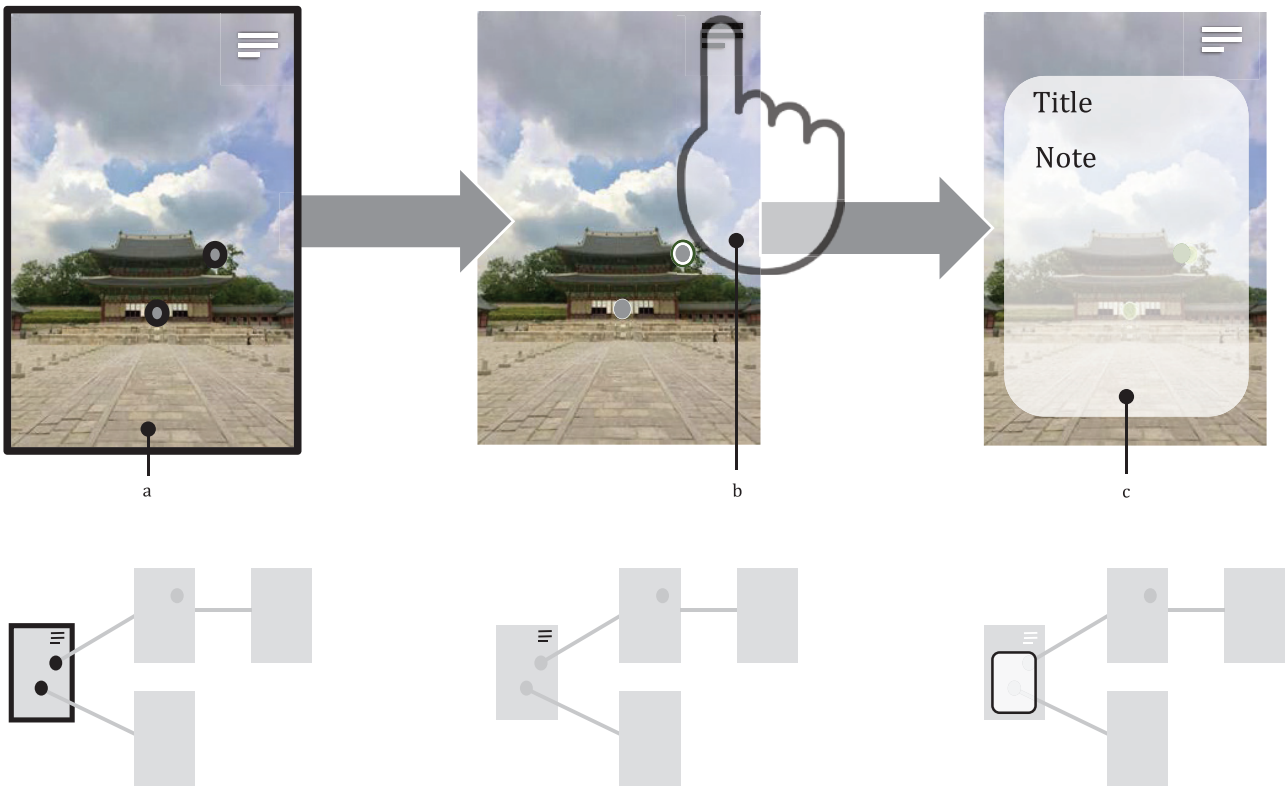
b) Selection of the text button

— The text button placed on the scene receives user interface events.

c) Presentation of a title and note

— When the text button receives a user event, the text window appears with the scene associated title and note.



a The viewer software presents a scene with sprite, title and note.

b The user selects the text button.

c The viewer software presents the title and note.

Figure 3 — An example of the scene associated title and text viewing process

6 Components of a scene

6.1 Image

A scene has an image component to display a 2D still image on the screen. In accordance with ISO/IEC 19566-5, a JUMBF URI reference to the box where the corresponding image codestream is described. Values to the components shall be found in Annex B.

6.2 Viewport

A scene has optional viewports which are used to define specific regions of interest to be displayed. When the media to be presented on the screen is a 2D image, the viewport shall be described by:

— X coordinate of the center of the region as a percent ratio for the image of the scene ,

— Y coordinate of the center of the region as a percent ratio for the image of the scene,

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— Field of view span for the X-axis as a percent ratio for the image of the scene, and

— Field of view span for the Y-axis as a percent ratio for the image of the scene.

Multiple viewports are described for each scene, and each viewport is identified by an ID. An ID is an integer starting at 1; ID value of 0 is reserved as described in Annex B, Table B.1. As described in subclause 7.3, it is specified which viewport to use through the viewport ID value in the link to the scene. If viewports are not described, the complete image is used as the viewport with default ID equal to 0. Values for the components shall be found in Annex B.

6.3 Title and note

A scene has text information such as title and note. If the title and note are described, the viewer software shall provide a user interface as shown in subclause 5.2. The properties of the title and note are defined in Annex B.

7 Components of a link

7.1 Reference to a destination scene

In accordance with ISO/IEC 19566-5, a JUMBF URI reference to the box where the destination scene is described. The properties of the reference are defined in Annex B.

7.2 Linkage region on 2D image of the source scene

A link is associated to a linkage region on the scene which expresses the specific part of the source scene to which a link is active. (Figure 4). A linkage region has a shape such as point, rectangle, and ellipse. The properties of the linkage region are defined in Annex B.

A linkage region as a point of a 2D image shall be described by:

— X coordinate of the center of the region as a percent ratio for the image of the scene and

— Y coordinate of the center of the region as a percent ratio for the image of the scene.

A linkage region as rectangle or ellipse on a 2D image shall be described by:

— X coordinate of the center of the region as a percent ratio for the image of the scene,

— Y coordinate of the center of the region as a percent ratio for the image of the scene,

— Width of the region as a percent ratio for the image of the scene,

— Height of the region as a percent ratio for the image of the scene, and

— Rotation angle (°) in the positive direction of the X axis is 0 ° and the counterclockwise direction in the positive direction.

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