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~~(ITU-T SG16)~~

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~~JBIG~~ ~~JPEG~~
~~Joint Bi-level Image Experts Group~~ ~~Joint Photographic Experts Group~~

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Information technology — JPEG Systems —

Part 10: Reference software

AMENDMENT 1: Additional reference software implementations

PROOF

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Information technology — JPEG Systems~~—~~ —

Part 10:
Reference software~~— Amendment~~

AMENDMENT 1: Additional reference software implementations

Subclause 4.4, Table 1

Add the following entries in the table:

Annex C	dbench-jumbf-2.0	ISO/IEC 19566-5	Yes	Yes	C++
Annex E	privsec-1.0 library	ISO/IEC 19566-4	Yes	Yes	Java
Annex G	jpeg360-1.0 library	ISO/IEC 19566-6	Yes	Yes	Java
Annex I	jlink-1.0 library	ISO/IEC 19566-7	Yes	Yes	Java
Annex K	jpeg-snack-1.0 library	ISO/IEC 19566-8	Yes	Yes	Java
Annex L	dbench-jpeg-snack-1.0	ISO/IEC 19566-8	Yes	Yes	C++

Subclause 4.4

Add the sentence at the end of the subclause:

The reference software implementations along with the respective reference datasets are available at https://standards.iso.org/iso-iec/19566/-10/ed-1/en/amd/1.

Annex C

Add the following new annex after Annex B:

Annex A
(informative)

JUMBF reference software: C++ implementation

A.1 General

This annex describes a Reference Software implementation (identified as Implementation Dbench-JUMBF) for ISO/IEC 19566-5 JPEG Systems – Part 5: JPEG universal metadata box format (JUMBF) [1].

This software is called "Dbench-JUMBF" written in C++ [7], and it is part of Doublebench's JPEG Systems Solution. The software has two parts: a core library and a command line interface (CLI) application. The core library provides classes for different data structures to support handling of different boxes defined in ISO/IEC DIS 19566-5:2022. The CLI provides the interface to use the functionalities of core library and allow parsing and generating standalone JUMBF files through the command line arguments. In addition, it implements the embedding and parsing of JUMBF structures inside JPEG images. The design of this software aims to be extended to support JUMBF structures from other JPEG Systems standards.

This annex provides information on the software design approach followed for this reference software for JPEG Universal Metadata Box Format (JUMBF), as defined in ISO/IEC DIS 19566-5:2022 Information technologies - JPEG systems - Part 5: JPEG universal metadata box format (JUMBF). In addition, it provides details on how to use the Dbench-JUMBF library and CLI application to successfully handle JUMBF data.

Subclause C.2 defines the hierarchical software design which translates the JUMBF model presented in ISO/IEC 19566-5, into a set of C++ classes in a structured and future-proof manner. Next, Subclause C.3 presents the requirements and the third-party dependencies required to compile, build and use the Dbench-JUMBF library. Finally, subclause C.4 demonstrates two example applications that use the library to provide an interface that allows the users to interact with JUMBF data.

A.2 Software design

A.2.1 General

The Doublebench JPEG Systems Solution aims to provide the means to support the generation and manipulation of JUMBF data. Doublebench JPEG Systems Solution imitates the structure of the JPEG Systems standards in the sense that it is a multi-module project. The basis of this multi-module project is the Dbench-JUMBF library which constitutes the main topic of this Annex. The jumbf library, as all defined modules of the project, covers the respective JPEG Systems standards including the amendments and revised editions that have been issued.

Like the JPEG Systems standards, jumbf is the main library that all other libraries rely on. The jumbf library provides the means to generate and parse information that is stored in JUMBF format. The library is implemented in C++ with an object-oriented approach, and it uses ISO C++14 Standard.

As specified in ISO/IEC 19566-5, it is possible to store JUMBF data as standalone files or inside a host image by embedding the boxes in APP11 markers. Regarding the first case, the jumbf library provides the classes to parse and generate JUMBF data directly from standalone files. Regarding the generation of standalone JUMBF data, the file extension ".jumbf" is used, corresponding to the concatenation of ISO Base Media File Format boxes. The current version of the library supports JPEG-1 files and standalone jumbf files.

The rest of the section describes the implementation of the classes that are defined in the scope of ISO/IEC 19566-5 standard. The core concept in this data model is a DbBox class. All other type boxes are derived from

the DbBox class as shown in Figure C.1. The DbBox class has all the necessary fields like “lbox”, “tbox”, “xl_box” and a pointer to “payload”. All the fields are kept private to ensure the integrity and consistency of the field’s data. Similarly, the DbBox class has all the necessary public methods implemented to set the values of fields and access those values. Implementation for any new box can be added by deriving it from DbBox and adding respective new fields and methods and overriding the existing methods.