INTERNATIONAL STANDARD

ISO 15706-2

Second edition
2023-01

Information and documentation — International Standard Audiovisual Number (ISAN) —

Part 2: Version identifier

Information et documentation — Numéro international normalisé d'oeuvre audiovisuelle (ISAN) —

Partie 2: Identifiant de version

Reference number
ISO 15706-2:2023(E)

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Published in Switzerland

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

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 ISO documents 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).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 46, *Information and documentation*, Subcommittee SC 9, *Identification and description*.

This second edition cancels and replaces the first edition (ISO 15706-2:2007), of which it constitutes a minor revision.

The changes compared to the previous edition are as follows:

— the introduction has been revised to include information about Registration Agencies;

— the normative references have been updated to reflect the most current version of the standards;

— the definitions for V-ISAN Authority, V-ISAN distributed query system, and V-ISAN registration agency have been removed;

— all references to the Registration Authority have been made to be generic throughout the document;

— a link to the ISO listing of Registration Authorities on the ISO website has been added;

— V-ISAN Authority has been changed to Registration Authority throughout the document;

— Clause 7 has been revised to remove references to specific Registration Authorities and Registration Agencies;

— Annex E has been revised to remove references to specific Registration Authorities and Registration Agencies.

A list of all parts in the ISO 15706 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

This document specifies the structure and basic criteria for the assignment of an identifier for versions of audiovisual works and other content derived from or directly related to an audiovisual work. It supplements the International Standard Audiovisual Number (ISAN) specified in ISO 15706-1 and provides a mechanism for identifying versions and related content of audiovisual works that have been registered in the International Standard Audiovisual Number (ISAN) system.

This document defines the version identifier component of the ISAN system, specifies the rules for assignment of the ISAN version identifier, and the basic administration and registration procedures for the ISAN version identification system.

The Registration Authority for ISO 15706 is the entity charged with oversight of the ISAN version identification system. The Registration Authority maintains a database of all version registration records (the register), issues new version identifiers upon proper request, and establishes the necessary operational procedures to keep the system functioning properly.

The Registration Authority makes version registration and information retrieval services available to those with a need to register new versions of audiovisual works or to obtain data about existing registrations. The Registration Authority provides services to applicants for new ISAN version identifiers, registrants of existing ISAN version identifiers, and other users.

The information contained in the version register is the minimum necessary to identify the versions to which specific ISAN version identifiers apply. It is often desirable to make additional information about the registered versions of audiovisual works available for access in a variety of ways. To enable the association of such additional information with a version registration, mechanisms are provided to link to entities providing access to that information. Those entities are called resolution service providers. The version register itself is not intended for complex queries (where one requests the ISAN version identifiers associated with specific complementary metadata), but that does not preclude the Registration Authority from providing such a service.

Information and documentation — International Standard Audiovisual Number (ISAN) —

Part 2: Version identifier

1 Scope

This document establishes a voluntary system for the identification of versions of audiovisual works and other content derived from or closely related to an audiovisual work (see Annex A). It is based on the International Standard Audiovisual Number (ISAN) system defined in ISO 15706-1. An ISAN combined with the version segment specified in Clause 4 constitutes an ISAN version identifier, hereinafter referred to as a V-ISAN. A V-ISAN is a registered, globally unique identifier for versions of an audiovisual work and related content.

A V-ISAN identifies a specific version or other content related to an audiovisual work throughout its life. It is intended for use wherever precise and unique identification of a specific version or other content related to an audiovisual work would be desirable, such as in audiovisual production and distribution systems, broadcasting applications, digital platforms and electronic program guides.

A V-ISAN identifies a specific version or other content related to an audiovisual work as the unique compound of its component elements (e.g. its artistic content, languages, editing and technical format) throughout its life and independent of any physical form in which that version or related content is distributed.

The assignment of a V-ISAN to a version or other content related to an audiovisual work does not constitute evidence of the ownership of rights to either that version or related content or to the audiovisual work itself.

This document specifies the basic systems and procedures to support the issuance and administration of V-ISANs.

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 639-2, *Codes for the representation of names of languages — Part 2: Alpha-3 code*

ISO 3166-1, *Codes for the representation of names of countries and their subdivisions — Part 1: Country code*

ISO/IEC 7064, *Information technology — Security techniques — Check character systems*

ISO 8601 (all parts), *Date and time — Representations for information interchange*

ISO 15706-1, *Information and documentation — International Standard Audiovisual Number (ISAN) — Part 1: Audiovisual work indentifier*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 15706-1 and the following apply.

ISO and IEC maintain terminological 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
ISAN
International Standard Audiovisual Number
number allocated for the unique identification of an audiovisual work in accordance with ISO 15706

3.2
private number
reserved *V-ISAN* (3.6) that has meaning only in the context of the organization that created it, is not registered with the V-ISAN register and is not normally exchanged between entities

Note 1 to entry: Since different entities may assign the same private number to different versions of a work, these numbers are not intended to be exchanged between entities.

3.3
resolution service provider
entity that maintains and makes available a set of additional metadata associated with specific *V-ISANs* (3.6)

Note 1 to entry: While the term resolution service provider is used in its singular form, there may be any number of providers.

Note 2 to entry: The provider optionally listed in the V-ISAN registration information is called the "designated" resolution service provider.

3.4
version
particular aggregation of elements that affects the content of an audiovisual work

Note 1 to entry: Any change that affects the content of an audiovisual work (e.g., artistic content, language, editing or technical format) and which requires separate identification for the use or exploitation of that specific content can be treated as a new version for the purposes of assigning a V-ISAN. See Annex A.

3.5
version segment
32-bit version segment specified in this document

3.6
V-ISAN
unique identifier composed of a registered *ISAN* (3.1) in combination with an appended version segment for a specific version or other content derived from or directly related to an audiovisual work, and allocated in accordance with this document

3.8
V-ISAN metadata
information associated with a version of a work identified by a *V-ISAN* (3.6)

Note 1 to entry: *V-ISAN metadata* (3.8) includes information such as the associated ISAN, the V-ISAN registration information, and descriptive information related to the audiovisual work or unique to that version of the audiovisual work.

3.9
V-ISAN register
database of registered *V-ISANs* (3.6) and the associated *V-ISAN metadata* (3.8) necessary for the operation of the V-ISAN system

3.10
V-ISAN registrant
entity associated with the registration of a particular *V-ISAN* (3.6)

Note 1 to entry: The V-ISAN registrant can be the original applicant or the entity currently responsible for keeping the required V-ISAN registration information and metadata up to date.

3.11
V-ISAN registration information
administrative class of *V-ISAN metadata* (3.8) that uniquely identifies the *V-ISAN registrant* (3.10) and provides other pertinent information required for administration of the V-ISAN system

4 Construction of the V-ISAN

4.1 A V-ISAN assigned to a version of an audiovisual work or to a related content entity shall incorporate the ISAN for the audiovisual work from which that version or related content is derived.

4.2 A V-ISAN shall consist of a 64-bit ISAN[1)] that has been registered in accordance with ISO 15706-1, followed by a 32-bit version segment. When represented using hexadecimal digits, this is equivalent to an ISAN of 16 characters followed by a version segment of eight characters, using Arabic numerals 0 to 9 and letters A to F of the Latin alphabet. See Figure 1.

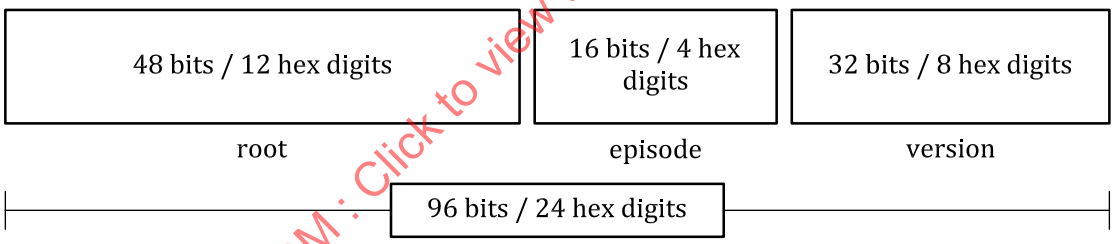


Figure 1 — Construction of a V-ISAN

4.3 As an aid to accurate transcription of V-ISAN in human-readable form (i.e. a form meant primarily to be read or written by a person such as on labels, physical carriers, technical documentation, etc., in contrast to a form primarily meant to be used by data processing equipment), a V-ISAN shall be preceded by the letters ISAN and include the check characters for both the ISAN segment and the V-ISAN as a whole (see Annex B). Further, it should be separated into groups after every four hexadecimal digits or check character using either a blank space or a hyphen. No internal meaning shall be ascribed to any combination of digits within these groups.

EXAMPLE ISAN RRRR-RRRR-RRRR-EEEE-X-VVVV-VVVV-Y

or

ISAN RRRR RRRR RRRR EEEE X VVVV VVVV Y

In the above example:

— "RRRR-RRRR-RRRR-EEEE" represents a registered ISAN for a specific audiovisual work.

1) When presented in hexadecimal form, an ISAN is composed of a 12-character root segment ("RRRR-RRRR-RRRR") followed by a four-character segment ("EEEE") for the identification of episodes or parts of an audiovisual work (see ISO 15706-1).

— "X" represents the check character for that ISAN, calculated in accordance with ISO 15706.

— "VVVV-VVVV" represents the version identifier segment linked to that ISAN. (The combination of the ISAN and the version identifier segment constitute the V-ISAN.)

— "Y" represents the check digit for that V-ISAN. It is computed over the positions labelled "R", "E" and "V". The position labelled "X" is not included in the computation of "Y". Figure B.1 shows the range of positions covered by each check character.

Additional encodings of V-ISAN are specified in Annexes C and D.

4.4 To avoid confusion, a V-ISAN version segment of 0 (i.e. 0000-0000) shall be treated as an ISAN without a version segment.

4.5 V-ISAN version segment range 1 (0000 0001 in hexadecimal) to 4 026 531 839 (EFFF FFFF in hexadecimal) are public numbers and shall be issued from and tracked within the V-ISAN register.

4.6 V-ISAN version segment range 4 026 531 840 (F000 0000 in hexadecimal) to 4 294 967 295 (FFFF FFFF in hexadecimal) are reserved for private numbers and shall not be issued from within the V-ISAN register. This corresponds to version segments where the first four bits are 1111 (i.e., hexadecimal value F). Private numbers are reserved solely for internal applications (e.g., to track internal edits during the preparation of a version for public release) as determined by a V-ISAN registrant who may self-assign such V-ISANs on a non-registered basis. Any time a V-ISAN with a private number is encountered external to the organization that created it, it shall be treated as if it has no version segment at all (i.e., treated as an ISAN without a version segment).

4.7 It is not meaningful to express information on a version or related content entity without reference to a specific audiovisual work. Therefore, the version segment shall only appear in conjunction with the ISAN for the work in question and in the form of a V-ISAN. The version segment of a V-ISAN shall have no meaning on its own.

4.8 A V-ISAN shall signify only that it is a globally unique identifier that has been registered with an agency of the V-ISAN system.

5 V-ISAN issuance

5.1 A V-ISAN shall be issued only in reference to a valid ISAN registered in the ISAN system in accordance with ISO 15706.

5.2 V-ISAN shall be issued to applicants by the Registration Authority.

5.3 Applicants for V-ISAN shall provide all of the registration data required by the Registration Authority prior to being issued a V-ISAN. The Registration Authority shall ensure that required registration data (see Annex E) is recorded in the V-ISAN register for each V-ISAN issued.

5.4 A V-ISAN may be assigned before, during, or after the production of the associated version of an audiovisual work, providing that the source work has been assigned an ISAN that is valid.

6 Affixing and displaying the V-ISAN

6.1 The V-ISAN for a version or content entity related to an audiovisual work shall be incorporated permanently in, or affixed to, all occurrences of that specific version or content entity to the extent that it is technically feasible to do so.

6.2 The V-ISAN should be included in the documentation, advertising and packaging associated with the specific version or content entity related to an audiovisual work.

6.3 The inclusion of a V-ISAN with a version of an audiovisual work shall conform to the specifications of ISO 15706 for inclusion of an ISAN with the audiovisual work.

6.4 The characters A to F appearing in a V-ISAN and A to Z appearing in either check character should be displayed in upper-case letters when the V-ISAN is presented in human-readable form. However, the lower-case and upper-case forms of these characters shall be treated as equivalent.

6.5 If a version of an audiovisual work is issued in a specific product item that has its own product numbering system (e.g., a Global Trade Item Number of the EAN.UCC system), the V-ISAN shall be displayed on the container and/or packaging of that product immediately below and clearly distinguished from any product numbers associated with the item.

6.6 Further details regarding methods of affixing a V-ISAN to a version of an audiovisual work are explained in the user's guide that is available from the Registration Authority.

7 V-ISAN system overview

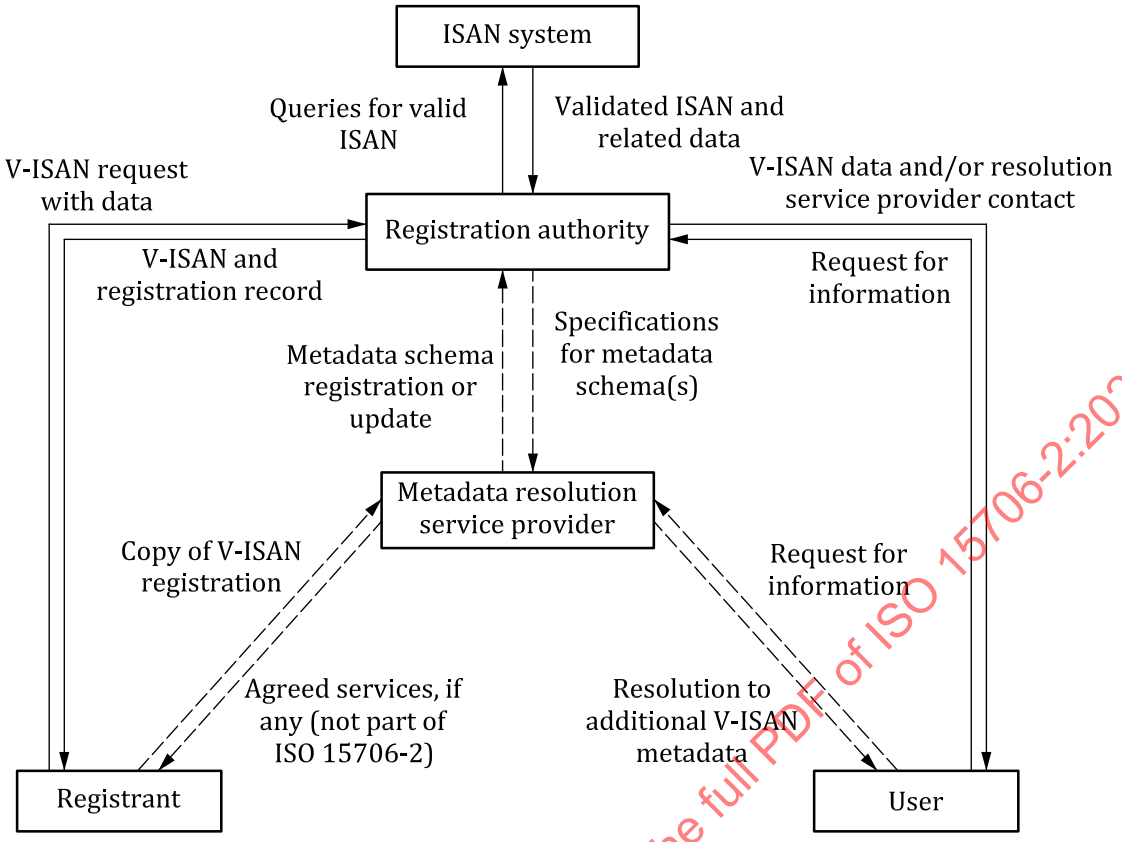
7.1 General

At the centre of the V-ISAN system is the Registration Authority, the entity responsible for overseeing the V-ISAN system. The Registration Authority maintains a register of all V-ISAN registration records, issues new V-ISANs upon proper request, and establishes the necessary operational policies and procedures to keep the system functioning properly.

The V-ISAN system shall work cooperatively with the ISAN system. Many V-ISAN functions require the cooperation of the ISAN system. For example:

— V-ISANs cannot be issued unless the associated ISAN has already been issued and is valid;

— V-ISAN registration records contain information about the version, but not about the work upon which the version is based. That data shall be obtained from the ISAN system.



NOTE The dashed lines indicate communication paths connecting to the resolution service provider(s). These paths are not defined in detail within this document.

Figure 2 — Overview of communication paths between entities in the V-ISAN system

V-ISAN users conduct their business through the Registration Authority who process all V-ISAN registration (issuance) requests, registration record updates, and V-ISAN registration data queries (requests for data contained within the registration record).

The V-ISAN is a version identifier; it is not an exhaustive descriptive data repository. When users need information that is not part of the registration record, and therefore not part of the V-ISAN system metadata, they need to contact a resolution service provider. The V-ISAN registration record contains the Internet domain name or intellectual property (IP) address of the designated resolution service provider for each V-ISAN (if the V-ISAN's registrant has provided one). This, or any other resolution service provider, may then be contacted via a defined syntax to obtain further descriptive data related to a particular V-ISAN.

The various entities interact with one another in different ways depending on the system action. The exact steps in each system action may differ depending on the specifics of the situation, but in general, all entities should use XML as their electronic encoding specification when exchanging data.

The name and contact information of the Registration Authority for this standard can be found at https://www.iso.org/mara.

7.2 Registration Authority

7.2.1 The Registration Authority for this document shall operate on an international basis.

7.2.2 The Registration Authority shall perform the following functions.

a) The Registration Authority shall conform fully with the specifications of ISO 15706 (all parts) for the ISAN and V-ISAN numbering systems.

b) The Registration Authority shall ensure efficient management of the V-ISAN number space.

c) The Registration Authority shall maintain the V-ISAN register and all supporting systems and records.

d) The Registration Authority shall make freely available the specifications for the V-ISAN reference XML metadata schema and a command and response syntax for accessing V-ISAN registers and performing metadata queries.

e) The Registration Authority shall provide a mapping that relates the V-ISAN reference metadata schema to a published metadata dictionary.

f) The Registration Authority shall establish and maintain the policies, procedures, guidelines and service level agreements necessary to support this document and ensure that the V-ISAN system functions properly, including at least the following:

   1) the specific contents of the V-ISAN register, including all data that are necessary for the proper performance of the V-ISAN system, such as:

      i) all ISANs issued and their present status as per the Registration Authority, and

      ii) for each V-ISAN issued, its associated ISAN;

   2) uni-directional and bi-directional system protocols, including at least the V-ISAN metadata command and response syntax and metadata schema, and the Registration Authority interfaces.

g) The Registration Authority shall establish a dispute resolution and appeals process to accept and respond to service complaints and disputes concerning V-ISAN policies and practices of the V-ISAN Authority.

7.2.3 The Registration Authority shall perform the following functions related to V-ISAN registration and query services:

a) convey new V-ISANs to registrants;

b) maintain required registration information (see Annex E) for each V-ISAN;

c) undertake reasonable steps to ensure the completeness of the registrant information and not knowingly process inaccurate information;

d) ensure that the V-ISAN register is updated within time limits it has specified;

e) develop procedures and electronic systems that support at least the following actions performed by authorized users:

   1) register a new V-ISAN,

   2) add or edit registration information (see Annex E),

   3) obtain a copy of all registration records for which the requesting entity is the registrant,

f) provide electronic systems that respond efficiently and accurately to queries with at least the following:

   1) descriptive information for the ISAN (see ISO 15706-1:2022, Annex D) associated with a V-ISAN,

   2) a designated portion of the current registration record information (see Annex E) for a V-ISAN,

3) the domain name or IP address for the designated resolution service provider of the V-ISAN (if any),

4) a count of the number of V-ISANs associated with an ISAN, and

5) a list of all issued V-ISANs associated with an ISAN;

g) provide authentication systems sufficient to ensure that:

1) only the registrant of record or its successor can alter the administrative metadata of an existing registration record, and

2) only the registrant of record, its successor, or its designated resolution service provider can alter the descriptive data of an existing registration record;

Any action requested with an invalid V-ISAN (e.g. an unassigned value or an incorrect check character) shall generate an appropriate error message. Any action requested with a missing or ignored version segment should be performed using the ISAN portion only.

7.3 Resolution service providers

7.3.1 Any number of resolution service providers may maintain additional metadata associated with a V-ISAN, but only the designated resolution service provider specified by the registrant shall be recorded in the V-ISAN registration record.

7.3.2 A designated resolution service provider shall be authorized to update the version descriptive data, but not the administrative metadata, for all V-ISANs for which it is the designated resolution service provider.

7.3.4 To conform with this document, a resolution service provider shall perform the following functions.

a) A resolution service provider shall provide additional metadata resolution services for all V-ISANs for which it has agreed to act as the designated resolution service provider.

b) A resolution service provider shall follow communication protocols established by the Registration Authority and respond to pre-defined queries with standardized responses.

c) A resolution service provider shall conform fully with the specifications of ISO 15706 (all parts) of the ISAN and V-ISAN numbering systems.

7.4 Registrants

Registrants shall perform the following functions:

a) conform fully with the specifications of ISO 15706 (all parts) for ISAN and V-ISAN numbering systems;

b) provide complete and accurate required registration information;

c) ensure that the required registration information maintained by the Registration Authority for the registrant's registered V-ISANs is complete, accurate and up to date.

7.5 Delegation to ISAN Registration Agencies

The ISAN Registration Authority may delegate certain tasks and services listed in 7.2.3 to Registration Agencies. Potential registrants are advised to consult the website of the Registration Authority[2] to find

2) Registration Authority details can be found at https://www.iso.org/mara.

information concerning the most appropriate Registration Agency to contact and the task and services it has been delegated with.

8 Fees

The Registration Authority may charge reasonable fees for V-ISAN related services.

Annex A
(normative)

Criteria for assigning V-ISAN

A.1 Versions of an audiovisual work

A.1.1 For the purposes of assigning V-ISAN, a distinct version of an audiovisual work may be defined by any of the following elements, alone or in combination:

a) a specific language track or combination of language tracks;

b) subtitling in a specific language;

c) a specific image, sound or broadcast format (e.g. wide screen or "pan & scan"; NTSC, PAL or SECAM);

d) editing of an audiovisual work for a specific purpose (e.g. television broadcast, digital distribution);

e) a change in the technical data stream that affects the content of the work (e.g. a different software program to generate background images; the vertical blanking interval for closed captioning).

A.1.2 The following changes do not constitute the creation of a distinct version of an audiovisual work and shall not result in the assignment of a new V-ISAN:

a) a change in the rights or ownership of an audiovisual work;

b) a copy in the identical format and recording medium (e.g. a tape-to-tape copy);

c) a change in the price or fees associated with use of an audiovisual work.

Changes in descriptive material or packaging and changes in the storage or transmission of a work without any accompanying change in the content of the work should not be treated as new versions.

A.1.3 Further details regarding changes that constitute the creation of a new version of an audiovisual work for the purposes of assigning V-ISAN are available from the Registration Authority.

A.2 Other content related to an audiovisual work

V-ISAN may also be assigned to other content that is derived from, or directly related to, an audiovisual work if such content is intended for broadcast or other mass distribution (e.g. digital platforms) and if it is necessary to manage such content in the broader context of an existing ISAN or V-ISAN application.

Examples of related content to which a V-ISAN may be assigned include:

a) the audio track of an audiovisual work when it is extracted and broadcast as a separate audio-only entity;

b) a descriptive audio track, closed-captioning track or double-system sound track for an audiovisual work;

c) a data stream which conveys an MPEG-4 compressed moving image over a broadcast automation system for decoding and display by the receiving device.

Annex B
(normative)

Check character for the V-ISAN

B.1 The purpose of the check character is to guard against errors resulting from improper transcription of a V-ISAN.

B.2 The check character for a V-ISAN shall be one alphanumeric character using Arabic numerals 0 to 9 and letters A to Z of the Latin alphabet. The check character for a V-ISAN as a whole shall be calculated over the 16 hexadecimal digits of its ISAN element and the eight hexadecimal digits of its version segment according to the MOD 37, 36 system specified in accordance with ISO/IEC 7064.

EXAMPLES

ISAN 153C-7365-B36F-844C-7-8734-9420-T

ISAN 083A 3317 3E20 0000 Z 8BA3 0357 7

ISAN 2B1A-FF17-3E20-6541-M-48CD-78B1-G

B.3 The check character for the ISAN character string shall be omitted during calculation of the check character for a V-ISAN character string.

B.4 Whenever a V-ISAN is displayed in human-readable form, its correct check character shall be added as the 26th character at the end of the V-ISAN character string. Note that the ISAN check character shall also be present in such cases so the resulting string of 26 characters incorporates two check characters:

— one for the ISAN (as the 17th character);

— one for the V-ISAN (as the 26th character).

The computation and the location of these check characters in the V-ISAN character string is illustrated in Figure B.1.

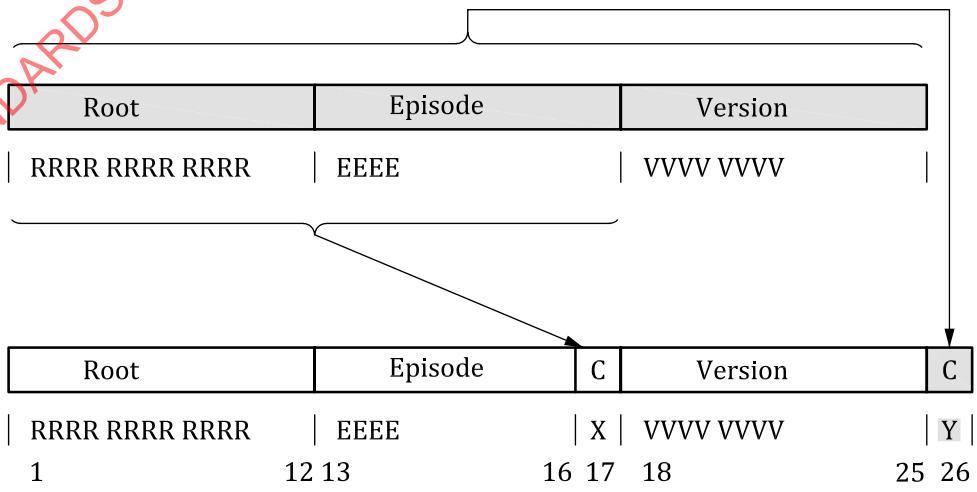


Figure B.1 — Computation of the check characters in a V-ISAN

B.5 Validation of a V-ISAN being entered into or retrieved from a database or other machine-readable format by a human shall require both correct check characters (for the ISAN root element and for the full V-ISAN character string) to be verified or presented.

B.6 System applications involving entry and retrieval of V-ISAN may use the public domain software for V-ISAN check digit calculation provided by the Registration Authority.

Annex C
(normative)

Binary encoding of V-ISAN

C.1 The V-ISAN, when represented in a binary, machine-readable form, shall be encoded as 96 binary bits. The leading letters "ISAN" and the check digits that are used when the V-ISAN is presented in human-readable form (see Clause 4) shall be omitted. The 96 bits are encoded and transmitted as an unsigned integer, most significant bit (msb) first (*uimsbf*, as used in ISO/IEC 13818-1). This is illustrated in Figure C.1.

Key

msb = most significant bit

lsb = least significant bit

Figure C.1 — Binary encoding of V-ISAN

Annex D
(informative)

XML encoding of V-ISAN

D.1 XML encoding

The V-ISAN, when represented in XML documents, should be encoded according to the schema given in D.2.

EXAMPLES

```
<ISAN root="rrrr-rrrr-rrrr" episodeOrPart="eeee" check1="x" version="vvvv-vvvv"
check2="y"/>
<ISAN root="rrrr-rrrr-rrrr" episodeOrPart="eeee" version="vvvv-vvvv"/>
<ISAN root="rrrr-rrrr-rrrr" episodeOrPart="eeee"/>
<ISAN root="rrrr-rrrr-rrrr"/>
```

where rrrr-rrrr-rrrr is the root value, eeee is the episode value, vvvv-vvvv is the version segment, check1 for the first check digit, and check2 for the second check digit, all encoded the same as for the human-readable form, omitting the leading letters "ISAN" and the check digits. Further, this encoding is compatible with the ISAN XML encoding, extended to include the version and check2 attributes.

In addition to the constraints defined in the XML schema of D.2, the encoding is additionally constrained as follows:

a) if the check1 attribute is present, then the episodeOrPart attribute shall be present;

b) if the version attribute is present, then the episodeOrPart attribute shall be present;

c) if the check2 attribute is present, then the check1 attribute shall be present;

d) unless the XML encoding is used strictly between machines, all attributes are required.

EXAMPLES The following forms are NOT permitted:

```
<ISAN root="rrrr-rrrr-rrrr" check1="x"/>
<ISAN root="rrrr-rrrr-rrrr" version="vvvv-vvvv"/>
<ISAN root="rrrr-rrrr-rrrr" episodeOrPart="eeee" version="vvvv-vvvv" check2="y"/>
```

D.2 XML schema

The following schema defines the V-ISAN XML encoding and is constructed in conformance with the W3C XML Schema Version 1.0[11].

```
<?xml version="1.0" ?>
<xsd:schema xmlns:xsd="http://www.w3.org/2001/XMLSchema" targetNamespace="https://www.
isan.org/ISAN" xmlns="https://www.isan.org/ISAN">
   <xsd:simpleType name="rootType">
      <xsd:restriction base="xsd:string">
         <xsd:pattern value="[\dA-Fa-f]{4}-[\dA-Fa-f]{4}-[\dA-Fa-f]{4}" />
      </xsd:restriction>
   </xsd:simpleType>
   <xsd:simpleType name="episodeOrPartType">
      <xsd:restriction base="xsd:string">
         <xsd:pattern value="[\dA-Fa-f]{4}" />
      </xsd:restriction>
   </xsd:simpleType>
   <xsd:simpleType name="versionType">
      <xsd:restriction base="xsd:string">
         <xsd:pattern value="[\dA-Fa-f]{4}-[\dA-Fa-f]{4}" />
      </xsd:restriction>
```