

# TECHNICAL SPECIFICATION

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Professional video storage equipment – Guideline of time code transmission  
**(standards.iteh.ai)**

IEC TS 62644:2012

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INTERNATIONAL  
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**PROFESSIONAL VIDEO STORAGE EQUIPMENT –  
GUIDELINE OF TIME CODE TRANSMISSION**

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Technical specifications are subject to review within three years of publication to decide whether they can be transformed into International Standards.

IEC 62644, which is a technical specification, has been prepared by technical area 6: Storage media, data structures, equipment and systems, of IEC technical committee 100: Audio, video and multimedia systems and equipment.

The text of this technical specification is based on the following documents:

Enquiry draft	Report on voting
100/1968/DTS	100/2022/RVC

Full information on the voting for the approval of this technical specification can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

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- replaced by a revised edition, or
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## INTRODUCTION

Time and control code is standardized in IEC 60461 and SMPTE ST 12-1:2008. Transmission of time code is standardized in SMPTE ST 12-2:2008.

Reference signal is often used for professional video storage in order to synchronize all equipment in a system. However there are no clear specifications for the transmission of time code under such system operation in these standards. When the system treats progressive video whose frame rate is 50 Hz or 59,94 Hz and when it uses reference signal, time code transmission of equipment may be treated differently and the interoperability may not be maintained.

Therefore, clear guidelines of time code transmission for professional video storage in such a system operation are expected.

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# PROFESSIONAL VIDEO STORAGE EQUIPMENT – GUIDELINE OF TIME CODE TRANSMISSION

## 1 Scope

This Technical Specification specifies the relationship between the reference signal and Ancillary Time Code (ATC) for use in professional storage equipment operating at 50 frames-per-second or 59,94 frames-per-second and handling progressive video signal under the system operation to maintain the frame pair which is composed of two frames.

## 2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

SMPTE ST 12-1:2008, *Television – Time and Control Code*

SMPTE ST 12-2:2008, *Television – Transmission of Time Code in the Ancillary Data Space*

SMPTE ST 318:1999, *Television and Audio – Synchronization of 59.94 – or 50-Hz Related Video and Audio Systems in Analog and Digital Areas – Reference Signals*

[IEC TS 62644:2012](#)

SMPTE ST 274:2008, *Television and Audio – 920 × 1 080 Image Data Sample Structure, Digital Representation and Digital Timing Reference Sequences for Multiple Picture Rates*

## 3 Terms and definitions

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

### 3.1

#### **time code**

abbreviation of time and control code defined in SMPTE ST 12-1:2008

### 3.2

#### **frame pair**

two time-consecutive frames of a video signal for which there is a first frame and a second frame

### 3.3

#### **ATC\_VITC1**

Ancillary Time Code Vertical Interval Code #1 Payload Type defined in SMPTE ST 12-2:2008

### 3.4

#### **ATC\_VITC2**

Ancillary Time Code Vertical Interval Code #2 Payload Type defined in SMPTE ST 12-2:2008

### 3.5

#### **field mark flag**

field identification flag defined in SMPTE ST 12-1:2008



**3.6**

**reference signal**

external reference signal for synchronization defined in SMPTE ST 318:1999 or SMPTE ST 274:2008

**4 Transmission of time code**

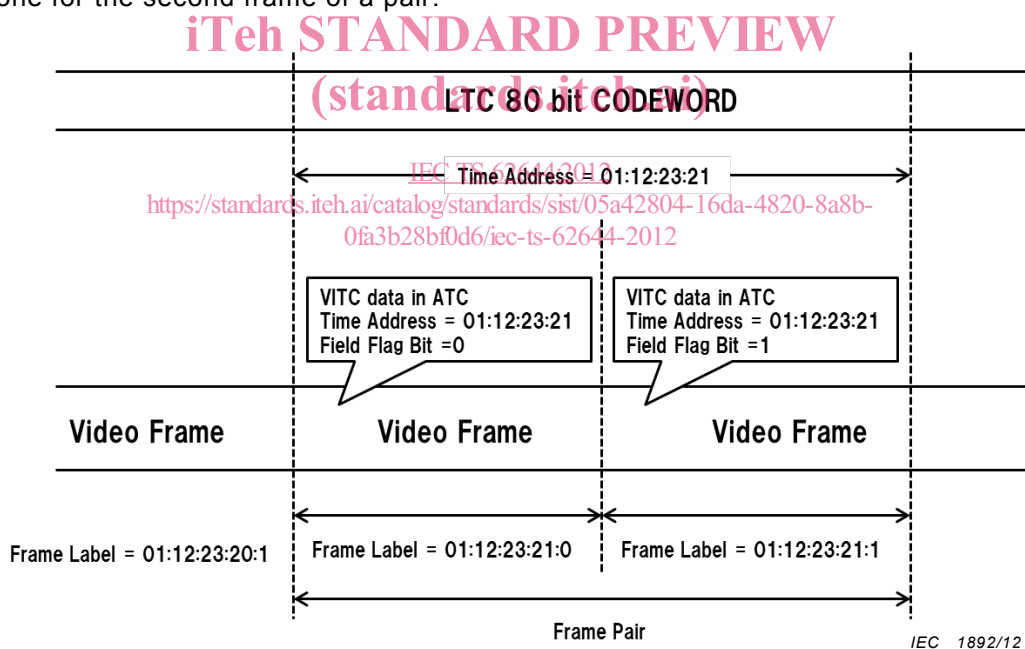
**4.1 Time address of a frame pair in progressive systems**

This subclause is given for information.

Time address of a frame pair in progressive systems is specified in SMPTE ST 12-1:2008 as follows.

Since the frame frequency of 50 frames-per-second and 59,94 frames-per-second progressive system exceeds the frame count capacity of the time address, the count is constrained to increment only every other frame (as shown in Figure 1). This results in an edit resolution of two frames.

Where the time code is conveyed as VITC data (for example as in ATC), it is recommended that the field mark flag is used to identify each frame of the frame pair. The preferred implementation is to set the field mark flag of the VITC data to zero for the first frame of a pair and to one for the second frame of a pair.



**Figure 1 – Time address of frame pair**

**4.2 Relationship between frame pair and ATC**

This subclause is given for information only.

The relationship between frame pair and ATC is specified in SMPTE ST 12-2:2008 as follows.

For progressive systems running at 50 frames-per-second or 59,94 frames-per-second, it is recommended that a packet of the ATC\_VITC1 payload type with the field mark flag set to zero and associated with the first frame of a pair alternate with a packet of the ATC\_VITC2 payload type with the field mark flag set to one and associated with the second frame of a pair.