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IEC 60461

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INTERNATIONAL STANDARD

Time and control code

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

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CONTENTS

FOREWORD.....	6
INTRODUCTION.....	8
1 Scope.....	9
2 Normative references.....	9
3 Terms, definitions and reserved.....	9
3.1 Terms and definitions.....	9
3.2 Reserved.....	11
4 Time representation in 30 frames per second and 60 frames per second systems.....	11
4.1 Definitions of real time and NTSC time.....	11
4.1.1 Definition of real time.....	11
4.1.2 Definition of NTSC time.....	11
4.2 Time address of a frame.....	11
4.2.1 Definition of time address of a frame.....	11
4.2.2 Non-drop frame – Uncompensated mode.....	12
4.2.3 Drop frame – NTSC time compensated mode.....	12
4.3 Colour frame identification in NTSC analogue composite television systems.....	12
5 Time representation in 25 frames per second and 50 frames per second systems.....	12
5.1 Definition of real time.....	12
5.2 Time address of a frame.....	12
5.3 Colour frame identification in PAL analogue composite television systems.....	13
5.3.1 Colour frame identification.....	13
5.3.2 Logical relationship.....	13
5.3.3 Arithmetic relationship.....	13
6 Time representation in 24-frame systems.....	13
6.1 Definitions of real time and NTSC time.....	13
6.1.1 Definition of real time.....	13
6.1.2 Definition of NTSC time.....	14
6.2 Time address of a frame.....	14
7 Structure of the time address and control bits.....	14
7.1 Numeric code.....	14
7.2 Time address.....	14
7.3 Flag bits.....	14
7.3.1 Definition of flag bits.....	14
7.3.2 Drop frame flag (NTSC composite television system only).....	14
7.3.3 Colour frame flag (NTSC and PAL composite television systems only).....	14
7.3.4 Binary group flags.....	15
7.3.5 Modulation method specific flag.....	15
7.4 Use of the binary groups.....	15
7.4.1 Binary group flag assignments.....	15
7.4.2 Character set not specified and unspecified clock time (BGF2=0, BGF1=0, BGF0=0).....	15
7.4.3 Eight-bit character set and unspecified clock time (BGF2=0, BGF1=0, BGF0=1).....	15
7.4.4 Date/time zone and unspecified clock time (BGF2=1, BGF1=0, BGF0=0).....	16
7.4.5 Page/line multiplex system and unspecified clock time (BGF2=1, BGF1=0, BGF0=1).....	16

7.4.6	Clock time specified and unspecified character set (BGF2=0, BGF1=1, BGF0=0).....	16
7.4.7	Unassigned binary group usage and unassigned clock time (BGF2=0, BGF1=1, BGF0=1)	16
7.4.8	Date/time zone and clock time (BGF2=1, BGF1=1, BGF0=0)	16
7.4.9	Specified clock time and page/line multiplex system (BGF2=1, BGF1=1, BGF0=1)	16
7.5	Clock time reference – Binary group flag combinations.....	16
8	Linear time code application.....	17
8.1	Code word format	17
8.2	Code word data content	17
8.2.1	LTC code word content	17
8.2.2	Time address.....	17
8.2.3	Flag bits	17
8.2.4	Binary groups	18
8.2.5	Synchronization word	18
8.2.6	Biphase mark polarity correction	19
8.3	Modulation method	19
8.4	Bit rate	20
8.5	Timing of the code word relative to a television signal	20
8.6	Linear time code interface electrical and mechanical characteristics.....	21
8.6.1	Measurements	21
8.6.2	Rise/fall time.....	21
8.6.3	Amplitude distortion	21
8.6.4	Timing of the transitions.....	21
8.6.5	Interface connector	21
8.6.6	Output impedance.....	21
8.6.7	Output amplitude	21
9	Vertical interval application – Analogue television systems	26
9.1	Code word format	26
9.2	Code word data content	26
9.2.1	VITC code word content.....	26
9.2.2	Time address.....	29
9.2.3	Flag bits	29
9.2.4	Binary groups	29
9.2.5	Field mark flag.....	30
9.2.6	Synchronization bits	30
9.2.7	Cyclic redundancy check code	30
9.3	Modulation method	31
9.4	Bit timing	31
9.5	Timing of the code word relative to the television signal	32
9.5.1	525/59,94 television system	32
9.5.2	625/50 television system	32
9.6	Location of the address code signal in the vertical interval	32
9.6.1	Location of the VITC code.....	32
9.6.2	525/59,94 television system	32
9.6.3	625/50 television system.....	32
9.6.4	Component television system.....	32
9.7	Redundancy	32

9.8	Vertical interval time code waveform characteristics.....	33
9.8.1	Waveform characteristics.....	33
9.8.2	Logic level.....	33
9.8.3	Rise/fall time.....	33
9.8.4	Amplitude distortion.....	33
10	Relationship between LTC and VITC.....	33
10.1	Time address data.....	33
10.2	Binary group data.....	33
10.2.1	General.....	33
10.2.2	Transferring vertical interval binary group data to linear binary group data.....	34
10.2.3	Transferring linear binary group data to vertical interval binary group data.....	34
10.3	VITC and LTC code word comparison.....	34
11	Progressive systems with frame rates greater than 30 frames per second.....	36
11.1	Time address of a frame pair in 50 and 60 frames per second progressive systems.....	36
11.2	Implementation guidelines.....	36
	Annex A (informative) Explanatory notes.....	37
	Annex B (informative) Converting time codes when converting video from 24 fps television systems.....	39
	Bibliography.....	42
	Figure 1 – Linear time code source output waveform.....	20
	Figure 2 – 29,97/30 frame linear time code example.....	22
	Figure 3 – 25 frame linear time code example.....	23
	Figure 4 – 24 frame linear time code example.....	24
	Figure 5 – Linear time code relationship to 59,94 frame progressive video example.....	25
	Figure 6 – 525/59,94 vertical interval time code address bit assignment and timing.....	27
	Figure 7 – 625/50 vertical interval time code address bit assignment and timing.....	28
	Figure 8 – Vertical interval time code waveform.....	31
	Figure 9 – Example of frame labeling for 50 and 60 frames per second progressive systems.....	36
	Figure B.1 – Example of conversion of 23,98 fps video to 525/59,94/I.....	40
	Figure B.2 – Example of conversion of 24 fps high definition video to 625/50/I.....	41
	Table 1 – Binary group flag assignments.....	15
	Table 2 – LTC time address bit positions.....	17
	Table 3 – LTC flag bit positions.....	18
	Table 4 – LTC binary group bit positions.....	18
	Table 5 – LTC synchronization word bit positions and values.....	19
	Table 6 – VITC time address bit positions.....	29
	Table 7 – VITC flag bit positions.....	29
	Table 8 – VITC binary group bit positions.....	30
	Table 9 – CRC bit positions.....	31
	Table 10 – VITC logic level ranges.....	33

Table 11 – Summation of VITC and LTC codeword bit definitions 35

INTERNATIONAL ELECTROTECHNICAL COMMISSION

TIME AND CONTROL CODE

FOREWORD

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International Standard IEC 60461 has been prepared by technical area 6: Professional electronics storage media, data structures and equipment, of IEC technical committee 100: Audio, video and multimedia systems and equipment.

This fourth edition cancels and replaces the third edition published in 2001, of which it constitutes a technical revision.

It includes the following significant change with regard to the previous edition: The time code for progressive television systems with a frame rate greater than 30 frames per second is added.

The text of this standard is based on the following documents:

CDV	Report on voting
100/1515/CDV	100/1616/RVC

Full information on the voting for the approval of this standard 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.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC web site under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

A bilingual version of this publication may be issued at a later date.

INTRODUCTION

IEC 60461 was originally developed for analogue television recording systems and thus dealt only with interlaced television systems operating with frame rates up to 30 frames per second. It is, however, flexible enough in design to be used in digital television systems, both standard definition and high definition. The support for progressive video systems with frame rates above 30 frames per second is described in this International Standard.

Clauses 4, 5, and 6 specify the manner in which time is represented in frame-based systems. Clause 7 specifies the structure of the time address and control bits of the code, and sets guidelines for storage of user data in the code. Clause 8 specifies the modulation method and interface characteristics of a linear time code (LTC) source. Clause 9 specifies the modulation method for inserting the code into the vertical interval of a television signal. Clause 10 summarises the relationship between the two forms of time and control code. Clause 11 summarises time code implementations for video formats with frame rates greater than 30 fps.

TIME AND CONTROL CODE

1 Scope

This International Standard specifies a digital time and control code for use in television, film, and accompanying audio systems operating at nominal rate of 60, 59,94, 50, 30, 29,97, 25, 24 and 23,98 frames per second. This International Standard specifies a time address, binary groups, and flag bit structure. In addition, the standard specifies a binary group flag assignment, a linear time code transport, and a vertical interval time code transport.

This International Standard defines primary data transport structures for linear time code (LTC) and vertical interval time code (VITC). This standard specifies the LTC modulation and timing for all video formats. This standard also defines the VITC modulation and location for 525/59,94 and 625/50 analogue composite and component systems only.

NOTE The digital representation of analogue VITC (D-VITC) is specified in SMPTE 266M and is defined for 525/59,94 and 625/50 digital component systems only. High definition formats, such as those documented in SMPTE 274M and SMPTE 296M, should use ancillary time code (ATC) as specified in SMPTE 12M-2 (formerly SMPTE RP 188) for transport of time code in the digital video data stream. For future implementations of time code for digital standard definition formats, the use of ATC rather than D-VITC is encouraged.

2 Normative references

The following referenced documents are indispensable for the application 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 646:1991, *Information processing – ISO 7-bit coded character set for information interchange*

ISO/IEC 2022:1994, *Information technology – Character code structure and extension techniques*

ITU-R BT.1700-1(2005), *Annex 2, Characteristics of composite video signals for conventional analogue television systems*

SMPTE 170M:2004, *Television – Composite Analog Video Signal – NTSC for Studio Applications*

SMPTE 258M:1993, *Television – Transfer of Edit Decision Lists*

SMPTE 262M:1995, *Television, Audio and Film – Binary Groups of Time and Control Codes – Storage and Transmission of Data*

SMPTE 309M:1999, *Television – Transmission of Date and Time Zone Information in Binary Groups of Time and Control Code*