IEC 62071-2

Edition 1.0 2005-10

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Helical-scan compressed digital video cassette system using 6,35 mm magnetic tape – Format D-7 – Part 2: Compression format

Système de magnétoscope numérique à cassette à balayage hélicoïdal à signal compressé utilisant une bande magnétique de 6,35 mm – Format D-7 – Partie 2: Format de compression

IEC 62071-2:2005

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HELICAL-SCAN COMPRESSED DIGITAL VIDEO CASSETTE SYSTEM USING 6,35 mm MAGNETIC TAPE – FORMAT D-7 –

Part 2: Compression format

FOREWORD

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International Standard IEC 62071-2 has been prepared by technical area 6: Higher data rate storage media, data structures and equipment of IEC technical committee 100: Audio, video and multimedia systems and equipment.

This bilingual version (2013-07) corresponds to the monolingual English version, published in 2005-10.

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

CDV	Report on voting
100/901/CDV	100/985/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.

The French version of this standard has not been voted upon.

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

IEC 62071 consists of the following parts, under the general title *Helical-scan compressed digital video cassette system using 6,35 mm magnetic tape – Format D-7:*

Part 1: VTR specifications

Part 2: Compression format

Part 3: Data stream format

This part 2 describes the specifications for encoding process and data format for 525i and 625i systems.

Part 1 describes the VTR specifications which are tape, magnetization, helical recording, modulation method and basic system data for video compressed data.

Part 3 describes the specifications for transmission of DV-based compressed video and audio data stream over 270Mb/s and 360 Mb/s serial digital interface.

The committee has decided that the contents of this publication will remain unchanged until the maintenance result 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- withdrawn;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.

HELICAL-SCAN COMPRESSED DIGITAL VIDEO CASSETTE SYSTEM USING 6,35 mm MAGNETIC TAPE – FORMAT D-7 –

Part 2: Compression format

1 Scope

This part of IEC 62071 defines the DV-based data structure for the interface of digital audio, subcode data and compressed video with the following parameters:

525/60 system – 4:1:1 image sampling structure, 25 Mb/s data rate;

525/60 system – 4:2:2 image sampling structure, 50 Mb/s data rate;

625/50 system – 4:1:1 image sampling structure, 25 Mb/s data rate;

625/50 system – 4:2:2 image sampling structure, 50 Mb/s data rate.

This standard does not define the DV compliant data structure for interface, of digital audio, subcode data and compressed video with the following parameters:

625/50 system – 4:2:0 image sampling structure, 25 Mb/s data rate

The compression algorithm and the DIF structure conform to the DV data structure as defined in IEC 61834. Differences between the DV-based data structure defined in this standard and IEC 61834 are shown in Annex A.

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.

ITU-R BT.601-5: 1995, *Studio encoding parameters of digital television for standard 4:3 and wide-screen 16:9 aspect ratios*

AES3-2003: *Serial transmission format for two-channel linearly represented digital audio data*

SMPTE 12M: 1999, *Television, Audio and Film – Time and Control Code*

3 Abbreviations and acronyms

AAUX	Audio auxiliary data
AP1	Audio application ID
AP2	Video application ID
AP3	Subcode application ID
APT	Track application ID
Arb	Arbitrary
AS	AAUX source pack
ASC	AAUX source control pack
B/W	Black and white flag

CGMS	Copy generation management system
CM	Compressed macro block
DBN	DIF block number
DCT	Discrete cosine transform
DIF	Digital interface
DRF	Direction flag
Dseq	DIF sequence number
DSF	DIF sequence flag
DV	Identification of a compression family
EFC	Emphasis audio channel flag
EOB	End of block
FR	Identification for the first half or the second half of each channel
FSC	Identification of a DIF block in each channel
LF	Locked mode flag
QNO	Quantization number
QU	Quantization
Res	Reserved for future use
SCT	Section type
SMP	Sampling frequency
SSYB	Subcode sync block
STA	Status of the compressed macro block
STYPE (see Note)	Signal type
Syb	Subcode sync block number
TF	Transmitting flag
VAUX	Video auxiliary data
VLC	Variable length coding
VS	VAUX source pack
VSC	VAUX source control pack

NOTE STYPE as used in this standard is different from that in ANSI/IEEE 1394.

4 Interface

4.1 General

As shown in Figure 1, processed audio, video and subcode data, are output for different applications through a digital interface port.

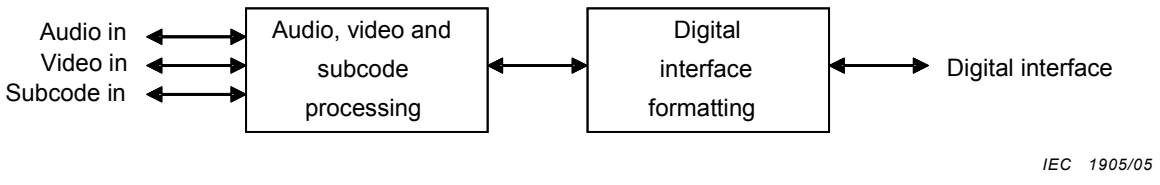


Figure 1 – Block diagram on the digital interface

4.2 Data structure

The data structure of the compressed stream at the digital interface is shown in Figures 2 and 3. Figure 2 shows the data structure for a 50 Mb/s structure, and Figure 3 shows the data structure for a 25 Mb/s structure.

In the 50 Mb/s structure, the data of one video frame are divided into two channels. Each channel is divided into 10 DIF sequences for the 525/60 system and 12 DIF sequences for the 625/50 system.

In the 25 Mb/s structure, the data of one video frame are divided into 10 DIF sequences for the 525/60 system and 12 DIF sequences for the 625/50 system.

Each DIF sequence consists of a header section, subcode section, VAUX section, audio section and video section with the following DIF blocks respectively:

Header section	:	1 DIF block,
Subcode section	:	2 DIF blocks,
VAUX section	:	3 DIF blocks,
Audio section	:	9 DIF blocks,
Video section	:	135 DIF blocks.

As shown in Figures 2 and 3, each DIF block consists of a 3-byte ID and 77 bytes of data. DIF data bytes are numbered 0 to 79.

Figure 4 shows the data structure of a DIF sequence for a 50 Mb/s or 25 Mb/s structure.

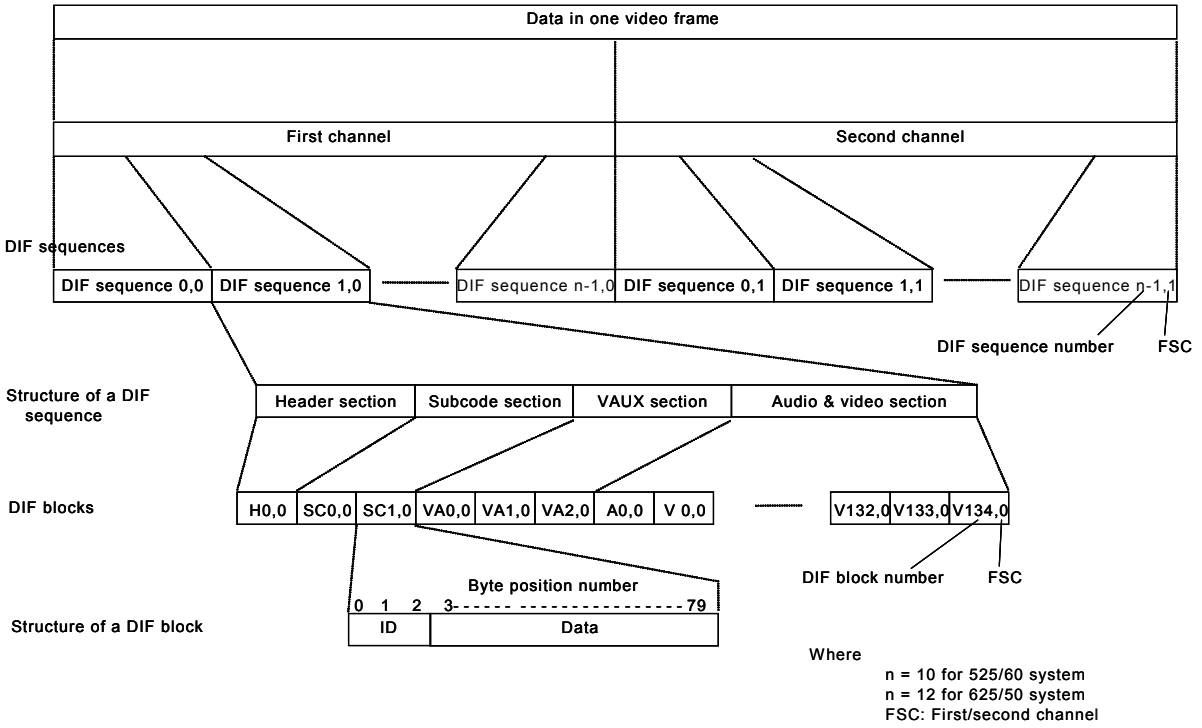


Figure 2 – Data structure of one video frame for 50 Mb/s structure

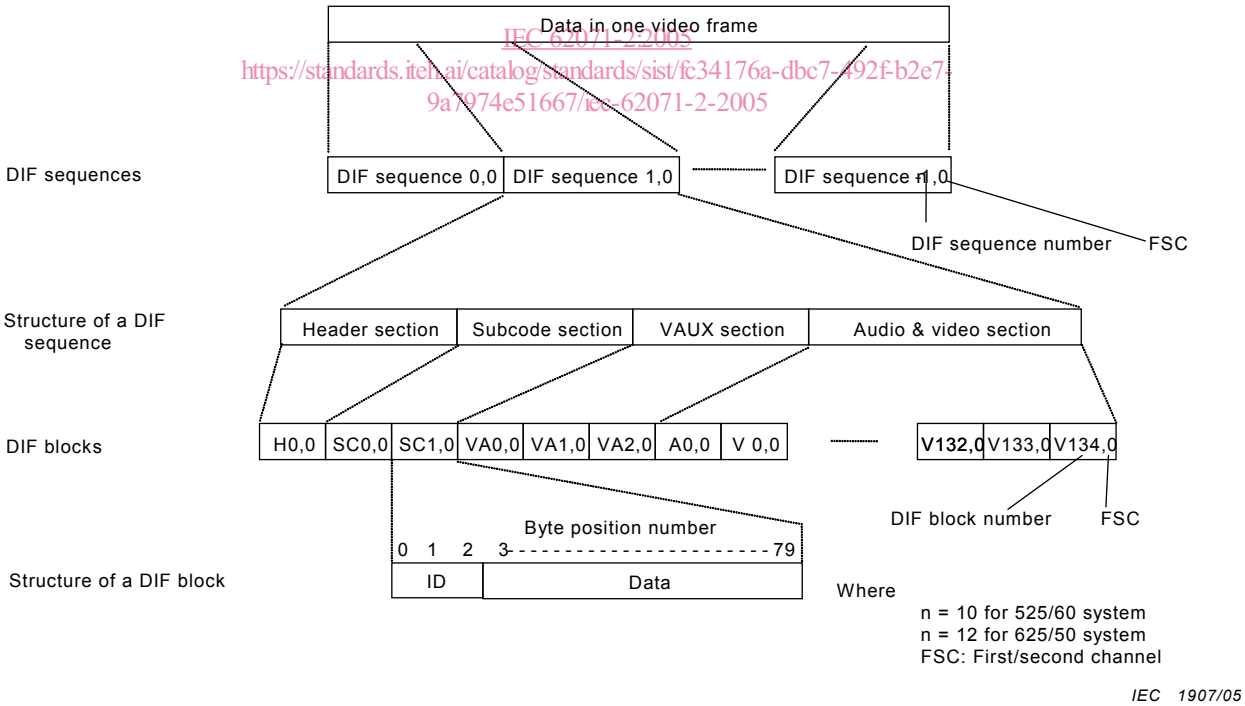
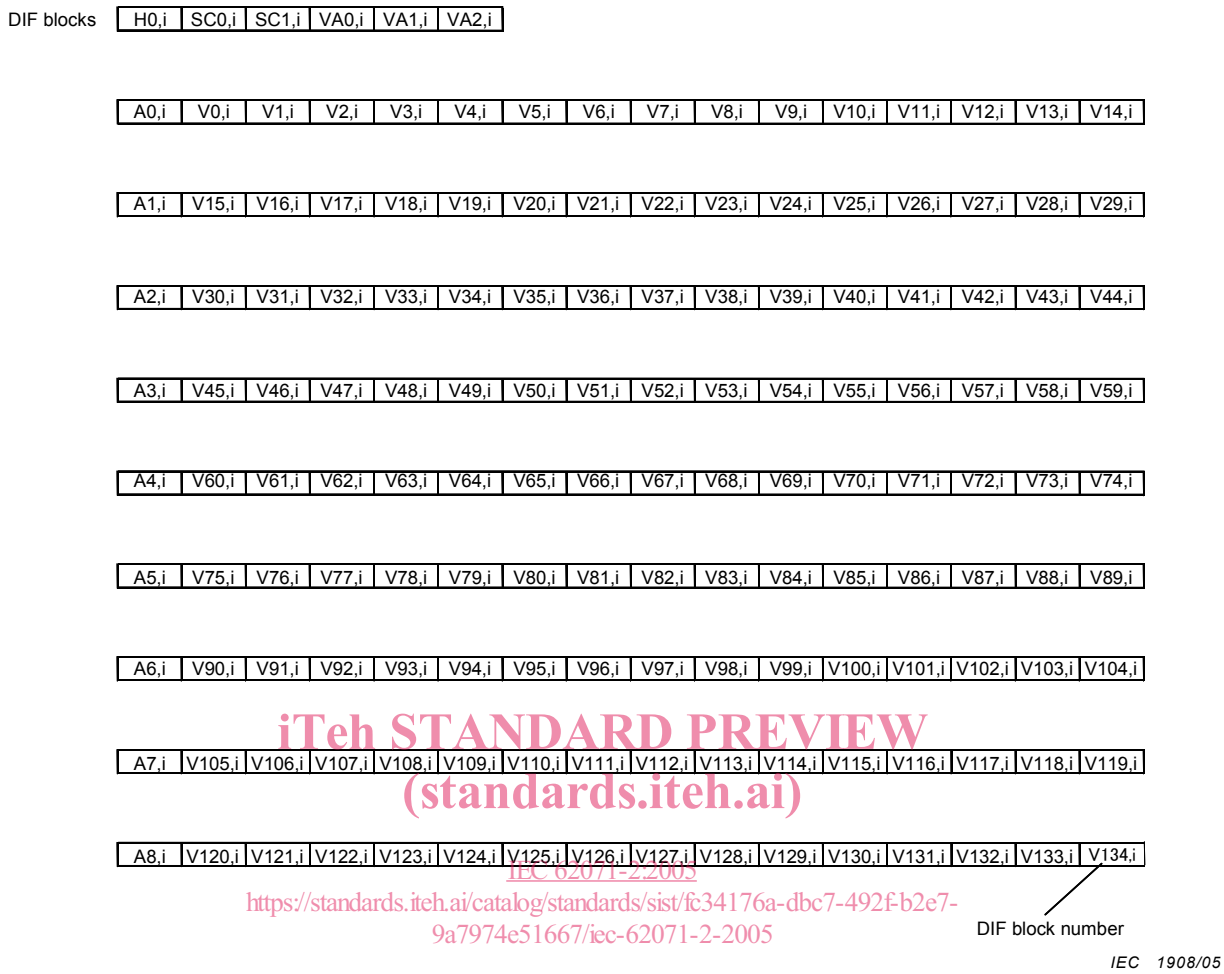


Figure 3 – Data structure of one video frame for 25 Mb/s structure



where

i : FSC
  i = 0 for 25 Mb/s structure
  i = 0,1 for 50 Mb/s structure

H0,i : DIF block in header section

SC0,i to SC1,i : DIF blocks in subcode section

VA0,i to VA2,i : DIF blocks in VAUX section

A0,i to A8,i : DIF blocks in audio section

V0,i to V134,i : DIF blocks in video section

Figure 4 – Data structure of a DIF sequence

4.3 Header section

4.3.1 ID

The ID part of each DIF block in the header section, shown in Figures 2 and 3, consists of 3 bytes (ID0, ID1, ID2). Table 1 shows the ID content of a DIF block.

Table 1 – ID data of a DIF block

	Byte position number		
	Byte 0 (ID0)	Byte 1 (ID1)	Byte 2 (ID2)
MSB	SCT_2	$Dseq_3$	DBN_7
	SCT_1	$Dseq_2$	DBN_6
	SCT_0	$Dseq_1$	DBN_5
	Res	$Dseq_0$	DBN_4
	Arb	FSC	DBN_3
	Arb	Res	DBN_2
	Arb	Res	DBN_1
LSB	Arb	Res	DBN_0

The ID contains the following:

SCT: Section type (see Table 2)

Dseq: DIF sequence number (see Tables 3 and 4)

FSC: Identification of a DIF block in each channel

50 Mb/s structure
FSC = 0: first channel
FSC = 1: second channel

25 Mb/s structure
FSC = 0

DBN: DIF block number (see Table 5)

Arb: Arbitrary bit

Res: Reserved bit for future use

Default value shall be set to 1.

Table 2 – Section type

Section type bit			Section type
SCT_2	SCT_1	SCT_0	
0	0	0	Header
0	0	1	Subcode
0	1	0	VAUX
0	1	1	Audio
1	0	0	Video
1	0	1	Reserved
1	1	0	
1	1	1	

Table 3 – DIF sequence number (525/60 system)

DIF sequence number bit				Meaning
$Dseq_3$	$Dseq_2$	$Dseq_1$	$Dseq_0$	
0	0	0	0	DIF sequence number 0
0	0	0	1	DIF sequence number 1
0	0	1	0	DIF sequence number 2
0	0	1	1	DIF sequence number 3
0	1	0	0	DIF sequence number 4
0	1	0	1	DIF sequence number 5
0	1	1	0	DIF sequence number 6
0	1	1	1	DIF sequence number 7
1	0	0	0	DIF sequence number 8
1	0	0	1	DIF sequence number 9
1	0	1	0	Not used
1	0	1	1	Not used
1	1	0	0	Not used
1	1	0	1	Not used
1	1	1	0	Not used
1	1	1	1	Not used