IEC 62330-3

Edition 1.0 2003-05

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Helical-scan digital video cassette recording system using 12,65 mm (0,5 in) magnetic tape – Format HD-D5 –
Part 3: Data stream format

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Système de magnétoscope numérique à cassette à balayage hélicoïdal sur bande magnétique de 12,65 mm (0,5 in) – Format HD-D5 –
Partie 3: Format de flux de données

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

HELICAL-SCAN DIGITAL VIDEO CASSETTE RECORDING SYSTEM USING 12,65 mm (0,5 in) MAGNETIC TAPE – FORMAT HD-D5 –

Part 3: Data stream format

FOREWORD

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International Standard IEC 62330 has been prepared by Technical Area 6: Higher data rate storage media and equipment of IEC technical committee 100: Audio, video and multimedia systems and equipment.

This bilingual version (2012-12) corresponds to the monolingual English version, published in 2003-05. It was submitted to the national committees for voting under the Fast Track Procedure as the following documents:

CDV	Report on voting
100/506/FCDV	100/605/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.

The committee has decided that the contents of this publication will remain unchanged until 2008. At this date, the publication will be

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- withdrawn;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

IEC 62330-3 consists of the following parts, under the general title *Helical-scan digital video cassette recording system using 12,65 mm (0,5 in) magnetic tape – Format HD-D5*.

– Part 1: VTR specifications
– Part 2: Compression format
– Part 3: Data stream format

Part 1 describes the VTR specifications which are tape, magnetization, helical recording, modulation method and basic system data for high definition video compressed data on 29,97 or 59,94 frame rate.

Part 2 describes the specifications for encoding process and data format for 1080i and 720p systems.

This part 3 describes the specifications for transmission of HD-D5 compressed video and audio data stream over 360 Mb/s serial digital interface.

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HELICAL-SCAN DIGITAL VIDEO CASSETTE RECORDING SYSTEM USING 12,65 mm (0,5 in) MAGNETIC TAPE – FORMAT HD-D5 –

Part 3: Data stream format

1 Scope

This part of IEC 62330 defines the data stream used for synchronous transmission of HD-D5 compressed video and audio data over 360 Mb/s serial digital interface (SDI) for the 525/60 system as defined in SMPTE 259M.

This practice does not define data stream structure applicable for transmission over the serial data transport interface (SDTI), SMPTE 305M.

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.

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ANSI/SMPTE 259M, *Television – 10-bit 4:2:2 Component and 4fsc NTSC Composite Digital Signals – Serial Digital Interface*

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https://standards.iteh.ai/catalog/standards/sist/f9fba004-da64-4f4c-b48b-db612c5f46ff/iec-62330-3-2003

ANSI/SMPTE 272M, *Television – Formatting AES/EBU Audio and Auxiliary Data into Digital Video Ancillary Data Space*

3 DIF block mapping

HD-D5 compressed digital video data, assembled as a DIF block stream, are mapped onto an SDI video field for transmission.

3.1 DIF block and DIF slice

One field of 1 080/60i, or one frame of 720/60p compressed video is represented by 5 760 DIF Blocks defined in Part 2 as shown in Figure 1.

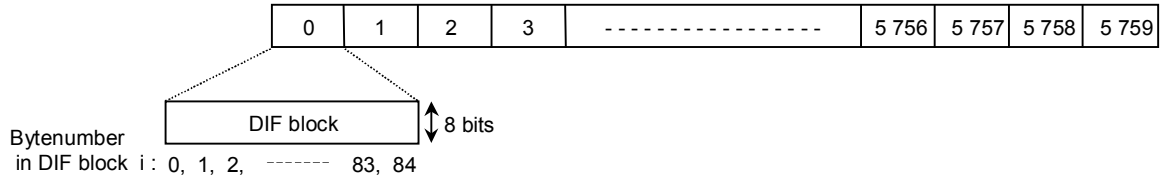

Figure 1 – DIF block

5 760 DIF blocks are divided into 480 DIF slices, each DIF slice comprising of 12 DIF blocks. DIF blocks in one field (1 080i), or one frame (720p) of video are numbered from 0 through 5 759. Likewise, DIF slices are numbered from 0 through 479.

The relationship between DIF block number (BN) and DIF slice number (SN) within the video field or frame is as shown below:

SN = int (BN / 12) where BN = 0 to 5 759

DIF Slice structure is shown in Figure 2.

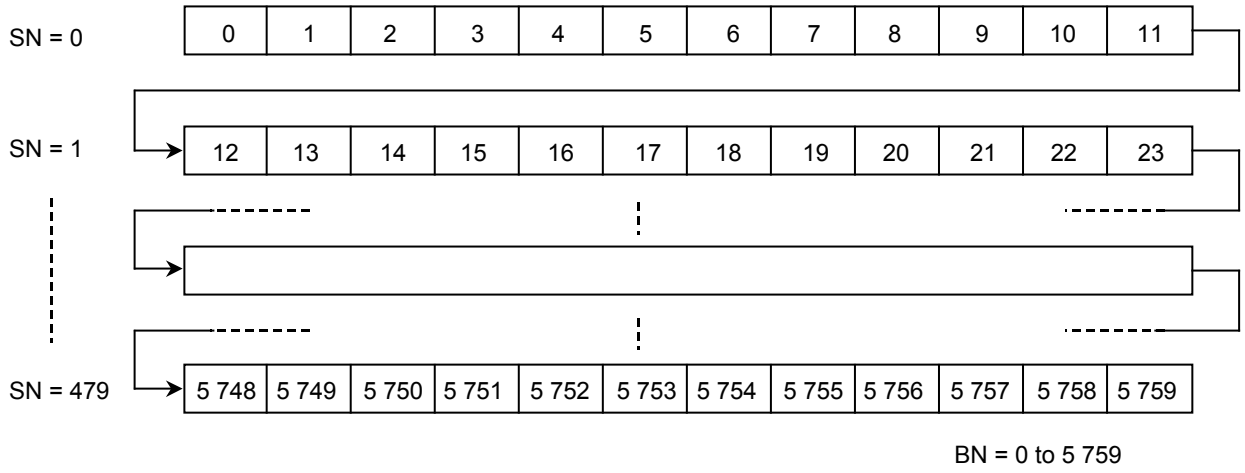

Figure 2 – DIF slice structure

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3.2 Mapping of DIF blocks over SDI

DIF Blocks shall be mapped into 360 Mb/s SDI that is specified in ANSI/SMPTE 259M. One 1 080i field or one 720p frame of 5 760 DIF blocks, containing 489 600 words, are mapped into a rectangular area of 1 920 word columns (from sample number 0 to 1 919 horizontally) by 255 word rows (from line number 9 to 263 in the first field or from line number 271 to 525 in the second field vertically) on SDI. In the case of 1 080i, DIF blocks of the 1st field compressed video data shall be mapped into the first field of SDI and DIF Blocks of the second field compressed video data shall be mapped into the second field of SDI respectively.

One field contains 480 slice cells. One slice cell is composed of 4 word columns by 255 word rows. The slice cell structure over SDI is shown in Figure 3. Each DIF slice (see Figure 2) is allocated into each slice cell according to the following expression:

$$CN = (SN \times 4) \bmod 480 + \text{int}(SN / 120)$$

where

SN: DIF slice number

CN: Slice cell number

Each slice cell is divided into 12 DIF areas. The DIF area, consisting of 85 words, has four different area configurations; i.e. type A through D as shown in Figure 4. Each DIF area is identified by a DIF area number (AN). The DIF block number (BN), DIF area number (AN), and slice cell number (CN) are correlated through the following expressions:

$$CN = \{ \text{int}(BN / 12) \times 4 \} \bmod 480 + \text{int}(BN / 1\,440)$$
$$AN = BN \bmod 12$$

where BN = 0 to 5 759

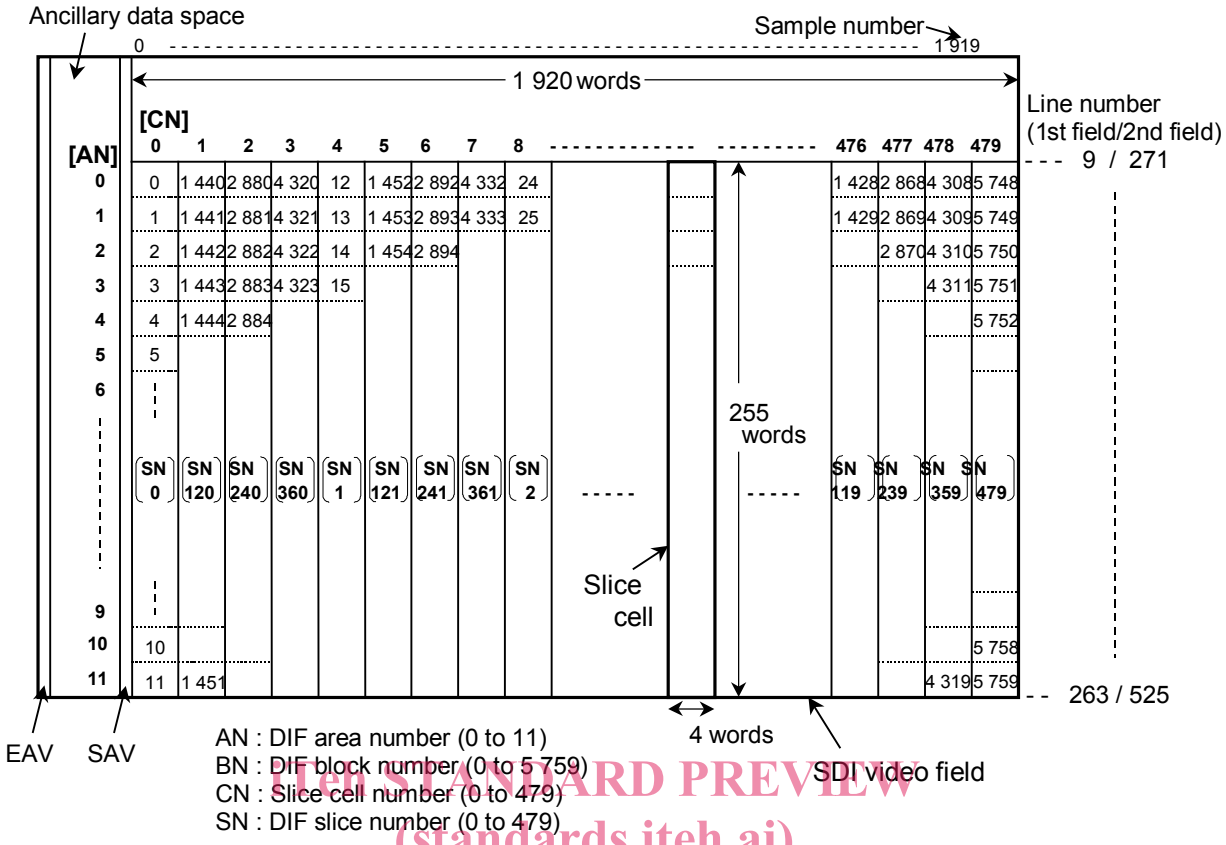

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Figure 3 – Slice sell structure over SDI

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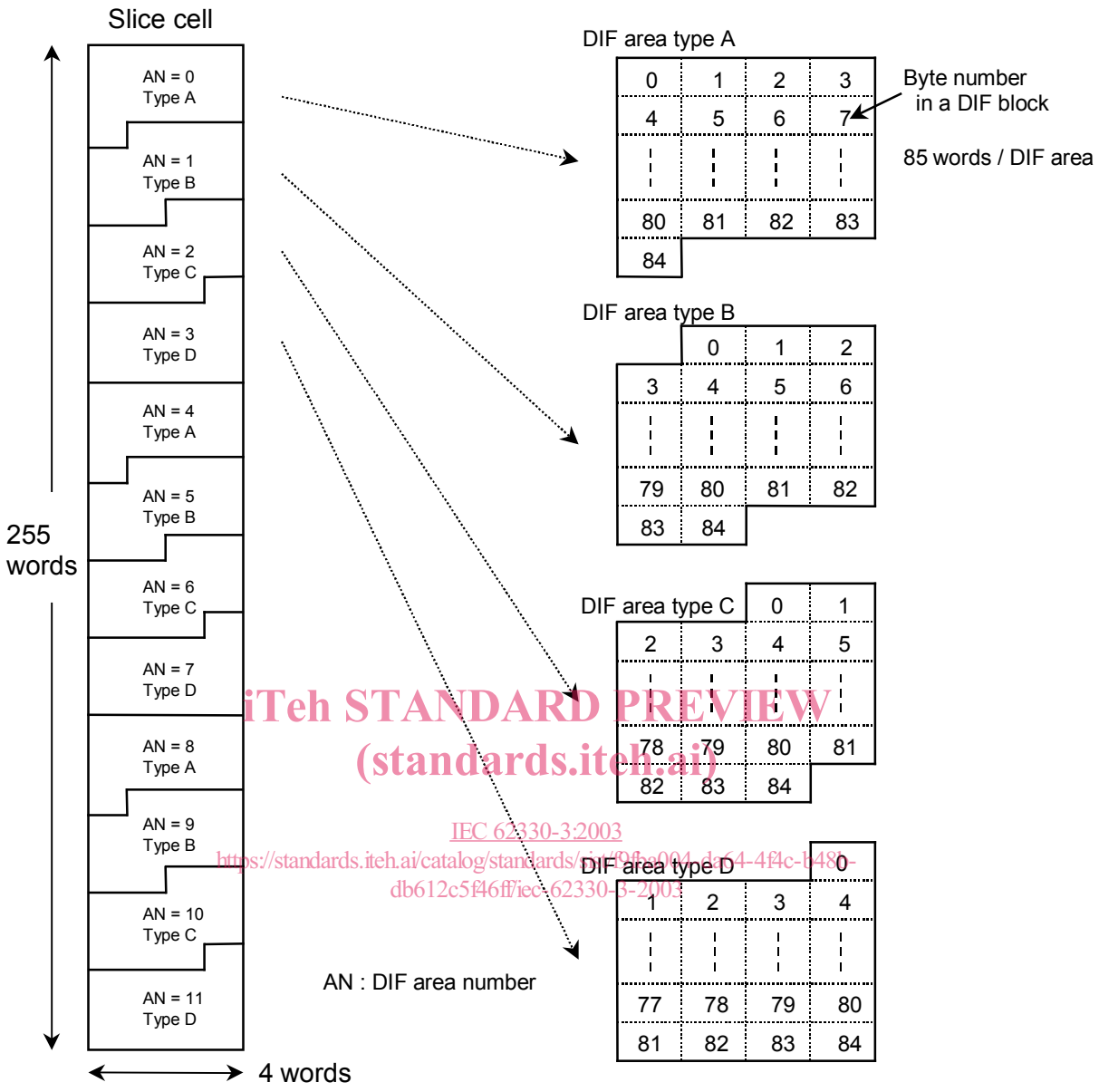

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Figure 4 – DIF area type and byte allocation of DIF blocks

3.2.1 Bit allocation

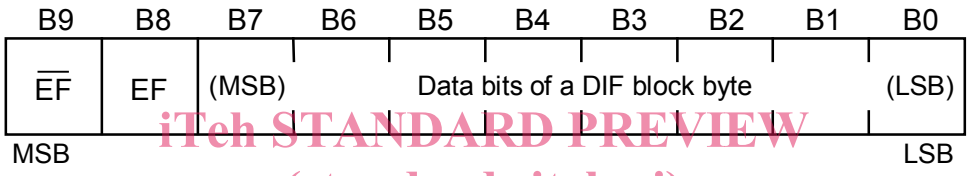
Data bits of a DIF block byte are placed into a SDI data word (see Figure 5) as follows:

Data bits of a DIF block byte: B7 through B0 of SDI bit
- B7: MSB of DIF block byte
- B0: LSB of DIF block byte

- B8 is error flag (EF) for B7 through B0
- B9 is the complement of B8

(EF = 0: No error exists in B7 through B0)

(EF = 1: Error exists in B7 through B0)



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EF : Error flag

$\overline{EF}$: Complement of error flag

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Figure 5 – Bit allocation

4 Audio data

The audio data format and transmission format shall conform to ANSI/SMPTE 272M.