IEC 62356-3

Edition 1.0 2003-11

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Video recording – 12,65 mm type D-11 format – Part 3: Data mapping over SDTI

Enregistrement vidéo – Format de type D-11 12,65 mm – Partie 3: Mappage de données à travers l'interface de transport de données série (SDTI)

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CONTENTS

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VIDEO RECORDING – 12,65 mm TYPE D-11 FORMAT –

Part 3: Data mapping over SDTI

FOREWORD

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International Standard IEC 62356-3 has been prepared by IEC technical committee 100: Audio, video and multimedia systems and equipment.

This bilingual version (2012-11) corresponds to the monolingual English version, published in 2003-11.

It was submitted to the national committees for voting under the Fast Track Procedure as the following documents:

CDV	Report on voting
100/631/CDV	100/701/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 2008-11. At this date, the publication will be

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- withdrawn;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

VIDEO RECORDING – 12,65 mm TYPE D-11 FORMAT –

Part 3: Data mapping over SDTI

1 Scope

This International Standard specifies the mapping of type D-11 compressed picture data stream into the SDTI payload area (SMPTE 305.2M) together with the mapping of four channels of AES3 data and time-code data into H-ANC packets. Type D-11 compressed picture data-stream mapping is defined for source-coded picture rates of 24/1,001/P, 24/P, 25/P, 50-I, 30/1,001/P and 60/1,001. For the transmission of compressed picture data coded at source picture rates of 25/P and 50/I, the SDTI interface operates at a frame rate of 25 Hz. For the transmission of compressed picture data coded at source picture rates of 30/1,001P and 60/1,001I, the SDTI interface operates at a frame rate of 30/1,001 Hz.

The transmission of compressed picture data coded at the source picture rates of 24/1, 001/P and 24/P require the SDTI interface to operate at frame rates of 24/1, 001Hz and 24 Hz with the parameters defined in Annexes A and B of this standard.

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.

IEC 62356-2: *Video recording – 12,65 mm type D-11 format – Part 2: Picture compression and data stream*[1]

SMPTE 259M:1997, *Television – 10-Bit 4:2:2 Component and 4fsc Composite Digital signals – Serial Digital Interface*

SMPTE 272M:1994, *Television – Formatting AES/EBU Audio and Auxiliary Data into Digital Video Ancillary Data Space*

SMPTE 291M:1998, *Television – Ancillary Data Packet and Space Formatting*

SMPTE 305.2M:2000, *Television – Serial Data Transport Interface (SDTI)*

SMPTE RP165:1994, *Error Detection Check words and Status Flags for Use in Bit-Serial Digital Interfaces for Television*

SMPTE RP188:1999, *Transmission of Time Code and Control Code in the Ancillary Data Space of a Digital Television Data Stream*

AES3:1992, *Serial transmission format for two-channel linearly represented digital audio data*

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[1] To be published.

3 General specifications

This standard specifies the mapping of type D-11 data stream packets over SMPTE 305.2M (SDTI). Type D-11 data stream comprises packets of basic blocks containing compressed picture data and auxiliary picture data as specified in IEC 62356-2.

Four channels of 24-bit AES3 data are optionally mapped into the H-ANC space of the interface according to SMPTE 272M. In addition, VITC may also be mapped into the H-ANC space.

Type D-11 data-stream packets are grouped into six equal data segments of which the first three data segments are mapped onto the first field of the SDTI and the last three data segments are mapped onto the second field of the SDTI, as shown in Figure 1 and Table 1.

Figure 1 also includes the optional four channels of 24-bit AES3 data mapped into the H-ANC space. VITC data may also be mapped into the H-ANC space.

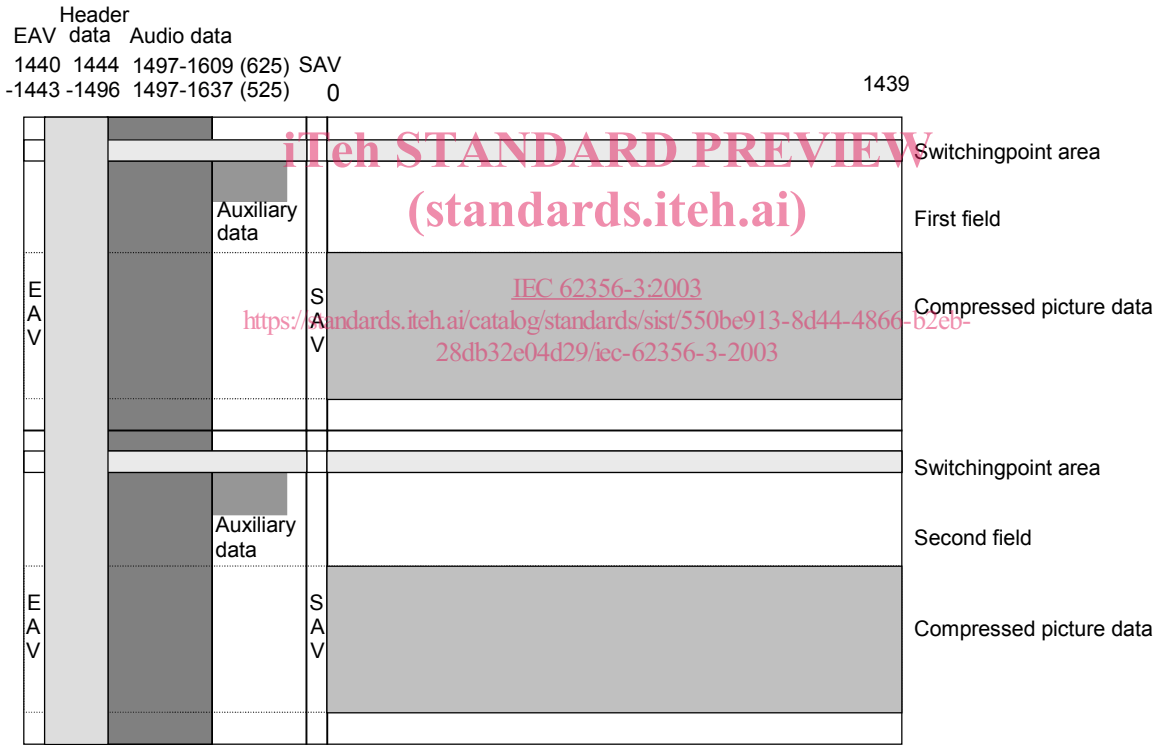

Figure 1 – SDTI mapping

Table 1 – Total number of lines and total number of samples per line for each frame rate of the interface

Frame rate of the interface	24/1,001Hz	24Hz	25Hz	30/1,001Hz
Total number of lines	525	625	625	525
Total number of samples per line	2 145	1 800	1 728	1 716
NOTE The 24/1,001 Hz and 24 Hz interface details are contained in Annexes A and B.				

4 Header data

4.1 Location of the header data

Header data shall be placed in H-ANC space and shall be located immediately following the EAV as shown in Figure 1 and as defined by SMPTE 305.2M.

4.2 Structure of the header data

The structure of the header data shall conform to SMPTE 305.2M and the contents shall be as shown in Table 2.

Table 2 – Contents of header data (total words: 53)

Word No.	Data name	Value	Comment
0	ADF	000h	
1	ADF	3FFh	
2	ADF	3FFh	
3	DID	140h	
4	SDID	101h	
5	Data count	22Eh	Data: 46 words
6	Line No.0	XXX	
7	Line No.1	XXX	
8	Line No. CRC 0	XXX	
9	Line No. CRC 1	XXX	
10	CODE & AAI	101h	Payload: 1440 words, AAI: Unspecified
11 – 26	Destination address	200h	
27 – 42	Source address	200h	
43	Block type	241h	Fixed block size with ECC: 1438 words
44	CRC flag	101h	Payload CRC
45	Reserved 0	XXX	
46	Reserved 1	XXX	
47	Reserved 2	XXX	
48	Reserved 3	XXX	
49	Reserved 4	XXX	
50	Header CRC 0	XXX	
51	Header CRC 1	XXX	
52	Check sum	XXX	

5 Payload data

5.1 Location of type D-11 stream data

Type D-11 data-stream packets (comprising compressed picture and auxiliary data) shall be mapped into the payload space of the SDTI and shall be located as defined in Table 3 and shown in Figure 1.

Table 3 – Location of compressed picture data

SDTI frame rate	24/1,001 Hz and 30/1,001 Hz	24 Hz and 25 Hz
Total number of interface lines	525	625
Horizontal mapping location	Samples 0 to 1 439	
Vertical mapping location First field Second field	 Lines 50 to 261 Lines 313 to 524	 Lines 59 to 270 Lines 372 to 583
NOTE The line numbering of the vertical mapping location is the same as that defined in SMPTE 259M.		

Each compressed picture data stream is divided into six equal segments, numbered 0 to 5, as defined in IEC 62356-2.

All the packets from segments 0 to 2 shall be mapped into the first field of the SDTI. All the packets from segments 3 to 5 shall be mapped into the second field of the SDTI.

Figure 2 defines how the data packets are mapped into each field of the SDTI.

5.2 Structure and contents of the SDTI payload lines

5.2.1 Payload line formatting

The SDTI payload lines shall contain the information defined in Table 4 and Figure 2.

Table 4 – Contents of compressed picture data

Word No.	Data name	Value	Comment
0	Data type	248h	Data type of type D-11
1	User data	200h or 1FEh or 1FDh	Valid data not exist Valid data start line Valid data line
2 to 1 437	User data	XXX	Type D-11 compressed picture data
1 438	Payload CRC 0	XXX	
1 439	Payload CRC 1	XXX	

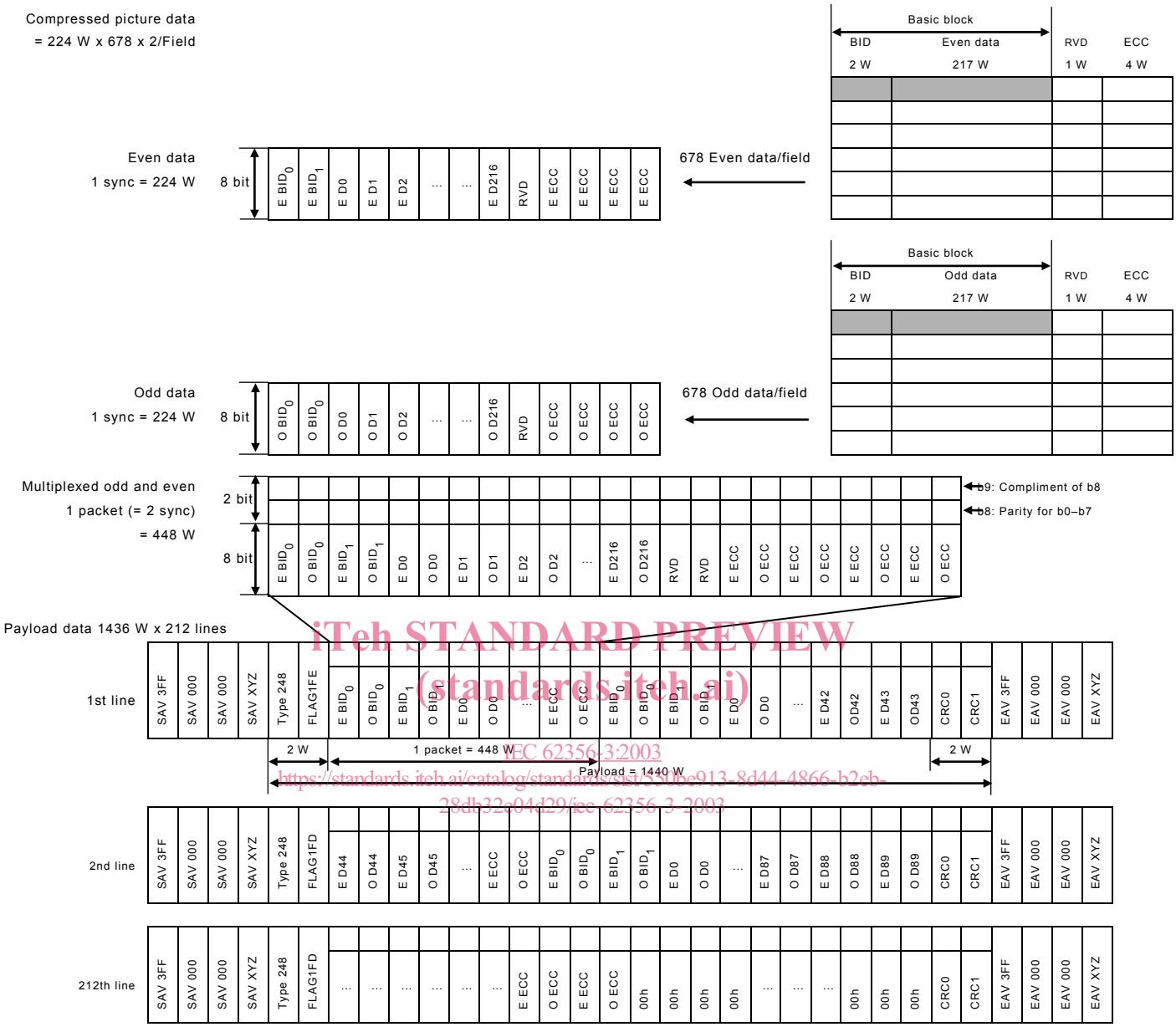

Figure 2 – Payload data-stream structure

For each field of the SDTI, 1 356 basic blocks of type D-11 compressed picture data shall be mapped into the SDTI payload area on contiguous lines. In each SDTI field, 678 odd and 678 even data blocks are respectively selected from channel 0 and channel 1 as specified in IEC 62356-2.

5.2.2 Basic block formatting

The compressed picture and auxiliary basic block format of type D-11 compressed data shall conform to IEC 62356-2.

For the purpose of transporting the basic blocks over SDTI, four bytes of Reed-Solomon ECC shall be added to each basic block. Between the end of each basic block and the start of the ECC a 1-byte reserved word shall be added.

The default value of the reserved word is zero.

Figure 3 illustrates the addition of the reserved word and the 4-byte RS ECC to a compressed picture basic block.

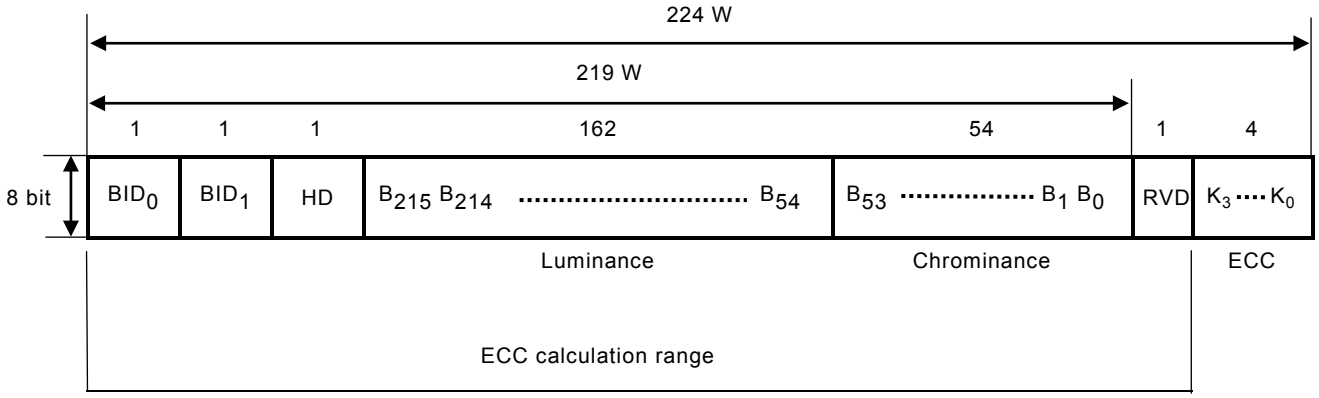

Figure 3 – Addition of reserved word and ECC to a compressed picture basic block

Figure 4 illustrates the addition of the reserved word and the 4-byte RS ECC to an auxiliary basic block

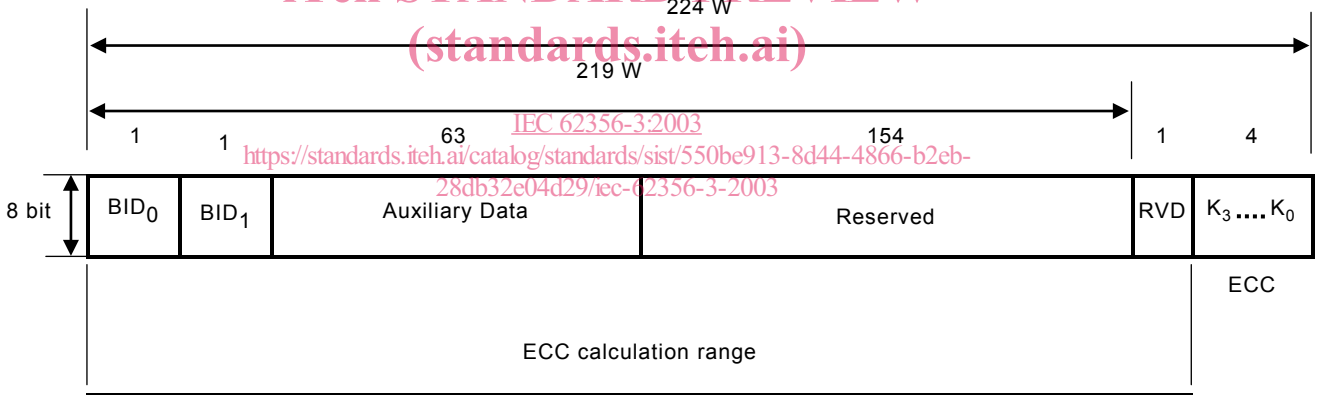

Figure 4 – Addition of reserved word and ECC to an auxiliary basic block

5.2.3 Error correction code (Reed-Solomon ECC)

Four words of Reed-Solomon ECC shall be added immediately after the reserved word (RVD).

The field generator polynomial of Reed-Solomon (RS) Error Correction Code shall be as follows:

Galois Field: GF(256)

Field generator polynomial: $X^8 + X^4 + X^3 + X^2 + 1$

where X^i are place-keeping variables in GF(2), the binary field. Note that the '+' sign for this and the following equations indicates modulo 256 addition.