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STANDARDIZATION SECTOR
OF ITU

J.89 Implementor's Guide

(June 2002)

SERIES J: TRANSMISSION OF TELEVISION, SOUND
PROGRAMME AND OTHER MULTIMEDIA SIGNALS

Digital transmission of television signals

Implementor's Guide for
ITU-T Recommendation J.89

**Transport mechanism for component-coded
digital television signals using MPEG-2 4:2:2
P@ML including all service elements
for contribution and primary distribution**

(Previously CCITT Recommendation)

Implementors' Guide

During the Study Group 9 meeting (Geneva, 3-7 June 2002) it was agreed to publish the present implementors' guide in view of correcting editorial faults in the current Recommendation J.89.

(Based on Contribution D49 from Japan*, see COM 9-R 4 § 2.2).

REVISION OF RECOMMENDATION J.89: TRANSPORT MECHANISM FOR COMPONENT-CODED DIGITAL TELEVISION SIGNALS USING MPEG-2 4:2:2 P@ML INCLUDING ALL SERVICE ELEMENTS FOR CONTRIBUTION AND PRIMARY DISTRIBUTION (Geneva, 1999)

This document describes the proposal for an editorial revision of Recommendation J.89. The revision consists of three correction points as shown in the body of this document, and the proposed editorial amendments is also attached to this document.

In the Recommendation, three revision points are found and summarized below.

1) In Table 1/J.89 included in Section 5.5, the descriptor of loop calculation is not correctly used, and the following correction is needed.

Original: `for(i=0,i<=data_count,i++){`

Proposed: `for(i=0,i<data_count,i++){`

2) In Table 2/J.89 included in Section 5.7, the number of bits assigned for stuffing_field is 43. However, this definition causes a problem to meet the limitation that PES_packet_length shall be $N \times 184 - 6$. The limitation is satisfied only when the number of data_unit and stuffing_unit is equal to $3 + (N-1) \times 4$ as shown in Figure 1. Therefore the length of stuffing_unit shall be identical to the length of data_unit, that is the number of bits assigned for stuffing_field shall be 44.

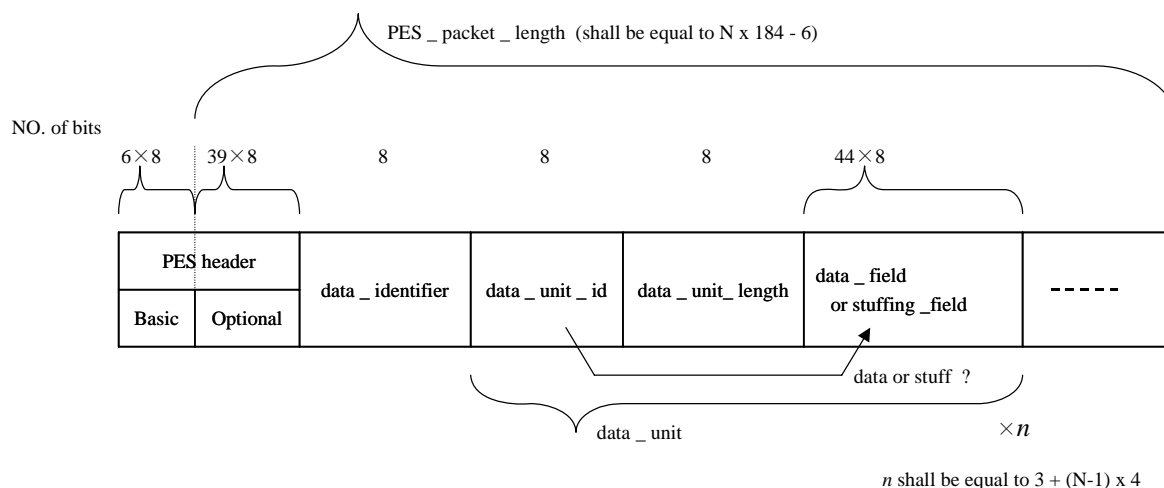


Figure 1 - The limitation for PES_packet_length

3) In Table 6/J.89 included in Section 5.7, the line_offset code seems to be defined as a sequential number starting form "0x00". However, the code "0xA0" follows "0x09" in the table, and "0xA0" shall be corrected as "0x0A".

The Annex to this document shows the proposed editorial amendments, with revision marks. For the sake of simplicity the Annexes only show the concerned sections of the Recommendation.

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Annex

(Proposed editorial revisions with revision marks)

5.5 Ancillary data

Ancillary data is defined by Recommendation ITU-R BT.1364 [6], and includes checksum, timecode and uncompressed digital audio defined in Recommendation ITU-R BT.1304 [7], Recommendation ITU-R BT.1366 [8], and Recommendation ITU-R BT.1305 [9], respectively. The following applies for transport of the ancillary data. This method may optionally be applied to audio stream according to Recommendation ITU-R BT.1305 [9].

5.5.1 PES packet format

Stream_Id: "1011 1101" (private_stream_1).

data_alignment_indicator: "1" (the PES packet header is immediately followed by the sync word).
Alignment_type "0x02" (Video Access Unit).

PTS_DTS_flags: "10" (PTS fields shall be present in the PES packet header).

PES_packet_data_byte: These bytes are coded in accordance with the ANC_data() syntax as defined below.

Table 1/J.89 – ANC data field

Syntax	No. of bits	Mnemonic
ANC_data() {		
for (i=0; i<N; i++) {		
ANC_data_field()		
while (!bytealigned)		
zero_bit	1	"1"
}		
for (i=0; i<N1; i++){		
stuffing_byte	8	"1111 1111"
}		
}		
ANC_data_field () {		
"0x000"	10	bslbf
line_number	10	bslbf
horizontal_offset	10	uimsbf
data_ID	10	bslbf
DBN_SDID	10	bslbf
data_count	10	bslbf
for (i=0, i<data_count; i++){		
user_data_word	10	bslbf
}		
checksum_word	10	bslbf
}		
NOTE – The ANC_data_field () consists of a header ("0x000", line_number, horizontal_offset) followed by the ancillary data packet content (as defined in Recommendation ITU-R BT.1364 [6]) starting after the ancillary data flag.		
line_number: This 10-bit word contains the line number (1 to 625 and 1 to 525 respectively).		
horizontal_offset: This 10-bit word contains the horizontal address (0 to 857 and 0 to 863 respectively) in a line indicated by the line_number.		

5.7 Data lines

The content of the data lines (for example Teletext according to Recommendation ITU-R BT.653-2 [10] and EBU data line according to EBU Tech 3217) are carried by packets defined with the syntax defined below. The data lines of one video frame form one or more access units.

5.7.1 PES packet format

The PES packet syntax and semantics are followed noting the following constraints:

Stream_Id:	"1011 1101" (private_stream_1).
PES_packet_length:	$N * 184 - 6$, where N is an integer.
data_alignment_indicator:	"1" (the PES packet header is immediately followed by the sync word). Alignment_type 0x02 (Video Access Unit).
PES_header_data_length:	Set to "0x24".
stuffing_byte:	The PES header is followed by as many stuffing bytes as are required to make up the header data length, so that the entire PES header is 45 bytes long.
PES_packet_data_byte:	These bytes are coded in accordance with the PES data field syntax specified in 5.7.2.

PTS and other optional fields may be present in the PES header, but the header length is always fixed.

5.7.2 Syntax for PES data field

See Table 2.

Table 2/J.89 – PES data field

Syntax	No. of bits	Mnemonic
PES_data_field () {		
data_identifier	8	uimsbf
for (i=0;I++){		
data_unit_id	8	uimsbf
data_unit_length	8	uimsbf
if (data_unit_id == stuffing_unit){		
stuffing_field	443*8	bslbf
}		
else{		
data_field ()		
}		
}		
}		

The syntax for data field is given in Table 3.

Table 3/J.89 – Teletext data field

Syntax	No. of bits	Mnemonic
data_field () {		
reserved	2	bslbf
field_parity	1	bslbf
line_offset	5	uimsbf
framing_code	8	bslbf
magazine_and_packet_address	16	bslbf
data_block	320	bslbf
}		

5.7.3 Semantics for PES data field

data identifier: This 8-bit field identifies the type of data carried in the PES packet. It is coded as indicated in Table 4.

Table 4/J.89 – Data identifier

Data identifier	Value
0x00-0x0F	reserved
0x10-0x1F	TXT data
0x20-0x7F	reserved
0x80	TC data
0x81-0x9E	reserved
0x9F	testline
0xA0	encoder information
0xA1-0xFF	reserved

The data identifier shall be set to the same value for each PES packet conveying data in the same Teletext data stream.

data unit id: This 8-bit field identifies the type of data unit. It is coded as indicated in Table 5.

Table 5/J.89 – Data unit id

Data unit id	Value
0x00	reserved
0x01	EBU data line
0x02	teletext system B, 625-line system, non-subtitle data
0x03	teletext system B, 625-line system, subtitle data
0x04	teletext system A, 625-line system
0x05	reserved
0x06	teletext system C, 625-line system
0x07-0x10	reserved
0x11	teletext system A, 525-line system
0x12	reserved
0x13	teletext system B, 525-line system
0x14	reserved
0x15	teletext system C, 525-line system
0x16	reserved
0x17	teletext system D, 525-line system
0x18-0x80	reserved
0x81	VITC and LTC
0x82	VITC
0x83-0xA0	reserved
0xA1	encoder status
0xA2	video coding parameters
0xA3-0xFE	reserved
0xFF	stuffing unit

data_unit_length: This 8-bit field indicates the number of bytes in the data unit following the length field. For data units carrying Teletext data, this field shall always be set to "0x2C".

stuffing_field: This 43-bytes field is used if needed to fill up the PES to the PES packet length defined in 4.7.1. The field is set to all ones.

reserved: Set to "1".

field_parity: This 1-bit flag specifies the field for which the data is intended; the value "1" indicates the first field of a frame, the value "0" indicates the second field of a frame.

line_offset: This 5-bit field specifies the line number on which the Teletext data packet is intended to be presented if it is transcoded into the VBI.

Within a field, the line-offset numbering shall follow a progressive incremental order except for the undefined line offset value "0". The toggling of the field parity flag indicates a new field. The line_offset is coded as in Table 6.

Table 6/J.89 – Line offset

line_offset	line number	
	625-line system	525-line system
	field_parity = 1 field_parity = 0	field_parity = 1 field_parity = 0
0x00	undefined undefined	undefined undefined
0x01-0x06	reserved reserved	reserved reserved
0x07	7 320	reserved reserved
0x08	8 321	reserved reserved
0x09	9 322	reserved reserved
0x0A0	10 323	10 273
---	---	---
0x15	21 334	21 284
0x16	22 335	reserved reserved
0x17-0x1F	reserved reserved	reserved reserved

framing_code, magazine_and_packet_address, data_block: These field correspond to the 43 bytes following the clock-run-in sequence of a Teletext data packet as defined in Recommendation ITU-R BT.653-2 [10], system B, 625/50 television systems. Data packets are inserted in the same order as they are intended to arrive at the Teletext decoder or to be transcoded into the VBI.

For other Teletext systems or the EBU data line the same scheme has to be applied. For lines containing less data bits the remaining bits of the data block are set to 1.