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Technical Specification

Television systems; Register of Country and Network Identification (CNI), Video Programming System (VPS) codes and Application codes for Teletext based systems

Reference
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Contents

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Foreword

This Technical Specification (TS) has been produced by Joint Technical Committee (JTC) Broadcast of the European Broadcasting Union (EBU), Comité Européen de Normalisation ELECtrotechnique (CENELEC) and the European Telecommunications Standards Institute (ETSI).

Significant changes since V1.2.3:

- The deliverable type of the present document has been changed from Technical Report (TR) to Technical Specification (TS).
- The tables in annexes A to D has been removed from the present document and are available only on the EBU web site (http://www.ebu.ch/). The contents of the tables are maintained by EBU.

NOTE: The EBU/ETSI JTC Broadcast was established in 1990 to co-ordinate the drafting of standards in the specific field of broadcasting and related fields. Since 1995 the JTC Broadcast became a tripartite body by including in the Memorandum of Understanding also CENELEC, which is responsible for the standardization of radio and television receivers. The EBU is a professional association of broadcasting organizations whose work includes the co-ordination of its members' activities in the technical, legal, programme-making and programme-exchange domains. The EBU has active members in about 60 countries in the European broadcasting area; its headquarters is in Geneva.

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1 Scope

The present document contains the so-far allocated values of the Network Identification (NI) field of the Teletext Broadcast Service Data Packet (extension data packet of type 8/30 format 1), and the Country and Network Identification (CNI) fields of the Programme Delivery Control (PDC) data packets (extension data packets X/26 and 8/30 format 2).

The present document also contains identification codes related to Video Programme System (VPS) CNI, which apply to German, Austrian and Swiss TV programme providers. Services like Teletext, PDC or VPS that contain Network Identification data in their formats may be used (besides their primary purpose) also as a reference for a source display or for Automatic Tuning Systems (ATS).

The CNI codes are also used in Electronic Programme Guide transmissions.

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication and/or edition number or version number) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies.

Referenced documents which are not found to be publicly available in the expected location might be found at http://docbox.etsi.org/Reference/.

[1] ETSI EN 300 231: "Television systems; Specification of the domestic video Programme Delivery Control system (PDC)".

[2] ETSI EN 300 706: "Enhanced Teletext specification".

[3] ETSI EN 300 707: "Electronic Programme Guide (EPG); Protocol for a TV Guide using electronic data transmission".

[4] ETSI EN 300 708: "Television systems; Data transmission within Teletext".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the following definitions apply:

bundle information structure: data within the stream carried by the Page Format-Clear method of data broadcasting that indicates the applications present in the stream

data stream: continuous or bursty sequence of data comprising application and transmission related components

hex or hexadecimal: number system with base 16

NOTE: In written form, equivalents of the decimal numbers 10 to 15 are replaced by the uppercase letters A to F.

independent data line: Teletext packet with address 30 or 31 that does not form part of a Teletext page

NOTE: It can be inserted at any point in the transmission cycle.

page format-clear: page-based method of broadcasting serial data streams via Teletext when the application does not require encryption techniques to be applied to the data

3.2 Abbreviations

For the purposes of the present document, the following abbreviations apply:

ATS	Automatic Tuning Systems
CNI	Country and Network Identification
IDL	Independent Data Line
LCI	Label Channel Identifier
LSB	Least Significant Bit
LUF	Label Update Flag
MSB	Most Significant Bit
NI	Network Identification
PCS	Programme Control Status
PDC	domestic video Programme/Delivery Control system
PIL	Programme Identification Label
PRF	Prepare to Record Flag
PTY	Programme Type
TV	TeleVision
VPS	Video Programme System

4 List of codes

The values of Network Identification codes of either type which have been so-far allocated and registered with the EBU, or identified from off-air reception, are given in annex A.

4.1 Teletext 16-bit Network Identification (NI) codes

These 16-bit codes are uniquely designated for use by a single broadcast network, by definition, within the entire world.

They are found in the teletext transmission in the so-called Broadcast Service Data Packet 30, Magazine 8, format 1, as defined in EN 300 706 [2]. The 16 bits occupy bytes 13 and 14 of the packet.

In this register the 16-bit codes are represented for convenience as 4-digit hexadecimal numbers. The number is read from left to right, the first transmitted bit being the Most Significant Bit (MSB) of the left-most hexadecimal number. Thus, for example, the code value AAE4 would be transmitted in the order 1010 1010 1110 0100. (This does not comply with other fields of packet 8/30 format 1).

In default of a unique 16-bit code having been allocated to a particular network, the network operator should transmit the value 0000.

4.2 PDC Network Identification (NI) codes

Programme Delivery Control (PDC) services provide Network Identification codes in the Country and Network Identification (CNI) parameter. Two versions of this are hidden from display in Teletext programme guide pages or extension data packet type 26s, and in programme labels of extension data packet type 8/30 format 2 or Video Programming System (VPS). These NI codes are uniquely designated for use by a single broadcast network or programme provider within a particular country (which is itself distinguished by a unique ITU country code), and it was generally left to the country to administer its own code allocations.

In earlier versions of this Register published by the EBU, the 11-bit coding used in extension packet 26 (Source Definition data group -4 bits in Data Word A plus 7 bits in Data Word B) was in all cases a direct subset of the 16-bit coding used in extension data packet 8/30 format 2. With the growth of satellite and other cross-border transmission, it has become increasingly possible to receive broadcasts from geographically widely-separated countries which may have been allocated arbitrarily identical 11-bit PDC codes. The Register was therefore rationalized in a way compatible with all existing consumer products to avoid the ambiguity that duplicated codes could cause. Users should therefore note the separation in the table of the PDC CNI codes into two columns representing the extension data packet 8/30 format 2 and extension data packet 26 versions.

NOTE: The relationship between the PDC NI codes and that of the Broadcast Service Data Packet (8/30 format 1), is entirely arbitrary.

For the detailed bit coding of the PDC CNI codes see EN 300 231 [1], clauses 7.3.2.3 and 8.2.1, which are reproduced below for convenience.

Extract 1 of EN 300 231 [1] from clause 7.3.2.3

7.3.2.3 Coding of preselection data in extension packets X/26

c) Source Definition data group

This function is invoked when the mode description bits are set to "01000".

Data word A:

- 4 least-significant bits: **Country of Origin;**
- 2 most-significant bits: set to "1".

Data word B:

- 6 least-significant bits: **Programme Source;**
- Most-significant bit: when "0", indicates the first set of 64 programme sources, when "1", indicates the second set of 64 programme sources.

Extract 2 of EN 300 231 [1] from clause 8.2.1

8.2.1 Transport via Teletext (ITU-R system B)

This transport method is able to carry the parameters CNI, PIL, PCS, LCI and PTY. A 20-character version of PTL is also provided.

The transport of the recording-control commands is carried out by means of the broadcast service data packets 8/30 format 2.

As illustrated in table 1, this packet includes the prefix (5 bytes), the designation code (1 byte) and the initial Teletext page (6 bytes). The next 13 bytes, numbered 13 to 25, are each (8, 4) Hamming coded using the method defined for system B Teletext.

The four message bits of byte 13 are used as follows:

Table 1

Byte 13 bit			
0	LCI b_1	Label Channel Identifier	
1	LCI b_2		
2	LUF	Label Update Flag	
3	PRF	Prepare to Record Flag	

The message bits of bytes 14 to 25 are used as follows; the arrangement is similar to the label coding method used in the dedicated television line transport method.

Table 2

Byte 14 bit	0	PCS b_1		Status of analogue sound	**Byte 20** bit	0	PIL b_{15}		
	1	PCS b_2				1	PIL b_{16}		
	2	MI		Mode identifier		2	PIL b_{17}		Minute
	3	-		Reserved but undefined		3	PIL b_{18}		
Byte 15 bit	0	CNI b_1	[MSB]		**Byte 21** bit	0	PIL b_{19}		
	1	CNI b_2		Country		1	PIL b_{20}		
	2	CNI b_3				2	CNI b_5	[MSB]	
	3	CNI b_4	[LSB]			3	CNI b_6		Country
Byte 16 bit	0	CNI b_9	[MSB]	Network	**Byte 22** bit	0	CNI b_7		
	1	CNI b_{10}	[LSB]	(or programme provider)		1	CNI b_8	[LSB]	
	2	PIL b_1				2	CNI b_{11}	[MSB]	
	3	PIL b_2				3	CNI b_{12}		
Byte 17 bit	0	PIL b_3		Day	**Byte 23** bit	0	CNI b_{13}		Network (or programme
	1	PIL b_4				1	CNI b_{14}		provider)
	2	PIL b_5				2	CNI b_{15}		
	3	PIL b_6				3	CNI b_{16}	[LSB]	
Byte 18 bit	0	PIL b_7		Month	**Byte 24** bit	0	PTY b_1		
	1	PIL b_8				1	PTY b_2		
	2	PIL b_9				2	PTY b_3		
	3	PIL b_{10}				3	PTY b_4		Programme type
Byte 19 bit	0	PIL b_{11}			**Byte 25** bit	0	PTY b_5		
	1	PIL b_{12}		Hour		1	PTY b_6		
	2	PIL b_{13}				2	PTY b_7		
	3	PIL b_{14}				3	PTY b_8		

The remainder of the packet (bytes 26 to 45) contains a 20-character version of PTL for display as a status message.

4.3 Application Type

Application Type codes appear in the Bundle Information Structure of a data broadcasting service using the Page Format-Clear protocol. This is fully defined in clause 4 of [4]. They enable a receiver to identify the applications present in the data stream. The codes allocated are shown in annex C.

4.4 Application Identifier

Application Identifier codes appear in an IDL-format B. Such Teletext packets are fully defined in clause 6 of [4]. The Application Identifier enables a receiver to accept/reject the applications present in a given data channel by filtering at the transport layer. The codes allocated are shown in annex D.

5 Coding examples

Packet X/26 Source Definition data group

Consider the X/26 code 32 07.

EN 300 231 [1] clause 7.3.2.3: c) (see clause 4) decrees that the X/26 Source Definition comprises two data words, A and B consisting of 6 bits and 7 bits respectively. Thus the above series of bits would be represented in binary as 11 0010 | 000 0111 (the two MSBs of Data Word A are always set to 1 in this Mode). For transmission, the Data Words A and B are placed Least Significant Bit (LSB) first, and interleaved with the parity bits (P_x) appropriate to Hamming (24,18). The resulting 24 bit Data Group becomes:

Data Word A										**Mode**						**Data Word B**							
↓ First bit transmitted										**Last bit transmitted ↓**													
P_1	P_2	0	P_3	1	0	0	P_4	1	1	0	0	0	1	0	P_5	1	1	1	0	0	0	0	P_6

Packet 8/30 format 2

Consider a packet 8/30 format 2 code with C = 24 and NI = C7. This is equivalent to the following sequence of 16 bits: 0010 0100 1100 0111.

From table 2, the transmission order of these CNI bits (ignoring the Hamming protection bits) is as follows:

bits	Byte 15		Byte 16		Byte 17		Byte 18		Byte 19		Byte 20		Byte 21		Byte 22		Byte 23	
∑	0 1	2 3	0 1	2 3	0 1	2 3	0 1	2 3	0 1	2 3	0 1	2 3	0 1	2 3	0 1	2 3	0 1	2 3
C	0 0	1 0											0 1		0 0			
NI			1 1													0 0	0 1	1 1
CNI bits	1 2	3 4	9 10										5 6		7 8	11 12	13 14	15 16

Equivalent Bit allocation for VPS:

	Byte 5				Byte 11				--	--	--	--		Byte 13				Byte 14		
0 1	2 3	4 5	6 7	0 1	2 3	4 5	6 7					0 1	2 3	4 5	6 7	0 1	2 3	4 5	6 7
		reserved																	

This order of transmission is necessary to align precisely with the bit ordering of VPS data lines.

Annex A (normative): Register of CNI codes for Teletext based systems

Table A.1 contains the register of Country and Network Identification (CNI) codes for Teletext based systems. Table A.1 can be found on the EBU web site (http://www.ebu.ch).

Annex B (normative): Register of VPS CNI codes

B.1 Network Identification (NI) for on screen display and/or Automatic Tuning Systems (ATS)

Services like Teletext, PDC or VPS that contain Network Identification data in their formats may be used - besides their primary purpose - also as a reference for a source display or for ATS.

Several programme providers (especially private ones, e.g. in Germany) "abuse" the programme delivery system VPS for the only purpose to make their channels identifiable by an ATS. In case of VPS, this is done by delivering permanently and invariably together with their CNI the "Timer Control code" (see EN 300 231 [1], figure 9, page 37) instead of Programme Identification Labels (PIL).

If a corresponding Teletext mode is used anywhere in networks without a "real" Teletext service, such a network could be made identifiable for ATS also by delivering simply one invariable Teletext line only, that carries as useful information not more than a Network Identification code (16 bits Packet 8/30 f1), e.g. out of a Programmable Read-Only Memory (PROM) in an Insertion Test-line Generator.

When VPS was defined some ten years ago the on screen display of the programme provider (or the network) was already envisaged. For this purpose it was decided (and supported both by the broadcasters and the manufacturers) to include in the list of VPS identification codes additionally both an 8-letter as well as a 16-letter abbreviation for the display of longer names of programme providers or networks. This way the provider or operator avoids, that different and ambiguous "texts" might be invented by different industry companies, if they cannot display the original name in full length. It may be disputable, whether with the display technologies of today (not only on screen) an 8-letter abbreviation for instance still is required. Industry members of a suitable working group might answer this question. Should this requirement still exist, one could envisage to include in a future edition of the present document such an abbreviations option also for the Packet 8/30 Format 1 codes, possibly for longer names only.

NOTE 1: In VPS the parameter CNI was planned to define not a network but a programme provider, because in Germany some networks are sequentially used for different programmes. With the appearance of ATS a problem arose and had to be solved, namely:

the two nation-wide separate networks of ARD on the one hand and of ZDF on the other hand are switched together on weekday mornings to provide simultaneously a specific programme. This is announced in the printed media (and in Teletext previews) as "Gemeinsames Vormittagsprogramm" and has, according to table B.1, a CNI = $DC3_{hex}$ different from that of ARD ($DC1_{hex}$) and of ZDF ($DC2_{hex}$). To enable ATS to conclude whether a channel delivering in the moment the code CNI = $DC3_{hex}$ will be during the regular time slots an ARD or a ZDF channel, additionally bit 3 in byte 5 of the dedicated TV line (16) has been assigned to differ between the two networks (see note in table B.1, row 3).

NOTE 2: Apart from its application for ATS this kind of identification codes (Packet 8/30 Format 1 and VPS) will also be used in the future as an indication of the selected channel in systems measuring the viewing rate in "panel households". In Germany such a system is just being developed.

B.2 Register of VPS CNI codes

This clause gives a register of identification codes related to VPS, which apply to German, Austrian and Swiss TV programme providers.

Table B.1 gives the VPS CNI Codes (hex) used in Germany, Switzerland and Austria.

Table B.2 gives the 8- and 16-letter abbreviations of programme providers in Germany, Switzerland and Austria.

Tables B.1 and B.2 can be found on the EBU web site (http://www.ebu.ch).

Figure B.1 shows the CNI code format details for VPS.

NOTE: The network codes in this table are also used in the Application Information structure of electronic programme guide broadcast according to EN 300 707 [3]. In this application the CNI field is 16 bits wide and the codes listed in this table should be extended with a leading "0". Thus in the EPG application, the VPS code "DC1" is represented as "0DC1".

Figure B.1 gives an example for Germany: ARD bundesweit = $DC1_{hex}$ in table B.1.

See also tables 8 and 9 in EN 300 231 [1].

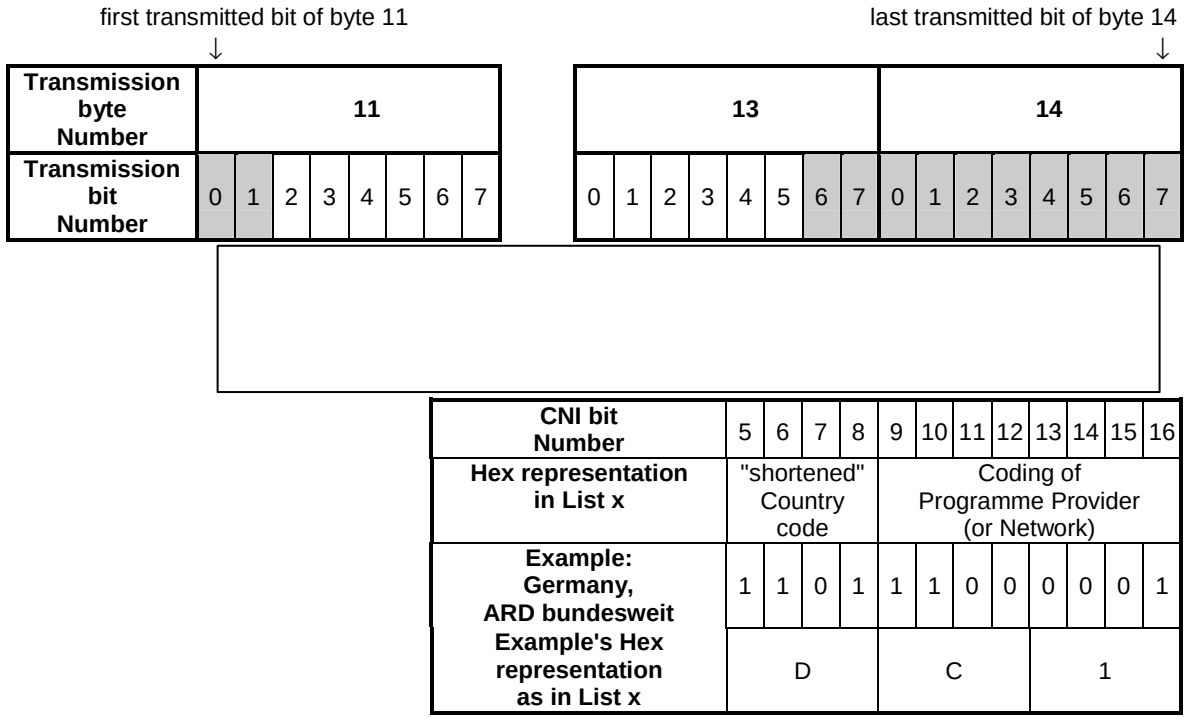

Figure B.1: CNI code format details for VPS
(VPS = Transport of recording control commands via a dedicated television line)

Annex C (normative): Register of Application Type codes for use with Page Format-Clear transmissions

Table C.1 contains the register of Application Type codes for use with Page Format-Clear transmissions. Table C.1 can be found on the EBU web site (http://www.ebu.ch).

Annex D (normative): Register of Application Identifier codes for use in IDL-format B

Table D.1 contains the register of Application Identifier codes for use in IDL-format B. Table D.1 can be found on the EBU web site (http://www.ebu.ch).

Annex E (informative): Bibliography

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History

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