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Elektronski (zaslonski) vodnik po programih – Protokol za TV vodnik z uporabo elektronskega prenosa podatkov

Electronic Programme Guide (EPG); Protocol for a TV Guide using electronic data transmission

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Electronic Programme Guide (EPG); Protocol for a TV Guide using electronic data transmission

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Foreword

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

NOTE: The EBU/ETSI JTC was established in 1990 to co-ordinate the drafting of ETSs in the specific field of broadcasting and related fields. Since 1995 the JTC 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

This European Telecommunication Standard (ETS) specifies the data formats for data broadcasting applications in general, and, specifically, for the Electronic Programme Guide (EPG) or TV Guide, also known by some other commercial slogans. The data required for these applications is transmitted by means of a data broadcasting protocol using the Vertical Blanking Interval (VBI) lines of a TV signal. It is also intended to coexist with other data-broadcasting applications running on affordable TV-sets, VCRs, or multi-media PCs. The EPG enables a receiver/decoder to store a programme database (and, if available, a navigation database), which can help the viewer to find the programmes of his preference.

2 Normative references

This ETS incorporates by dated and undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this ETS only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

[1] ETS 300 708: "Data transmission within Teletext".

[2] ETS 300 706: "Enhanced Teletext specification".

[3] ETS 300 231: "Television Systems; Specification of the domestic video Programme Delivery Control system (PDC)".

[4] ETR 288: "Code of Practice for an Electronic Programme Guide (EPG)".

[5] ISO 639.2: "Code for the representation of names and languages".

[6] prTR 101 231: "Register of Country and Network Identification codes for Teletext based systems".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of this ETS, the following definitions apply:

bundle: The data carrier as provided by ETS 300 708 [1]. It comprises a number of streams.

composite: A composite decoder is able to receive and to decode EPGs from more than one network and to combine them into a single composite EPG.

control data: This term is used to denote a combination of data fields in the EPG data structures which undergo a special encoding procedure.

escape sequence: A means of introducing additional, more complex display components into text strings (e.g. national characters, pictures).

event: A predefined action which may be selected in a product's user interface menu.

far programme: A programme which is not a near programme.

Filtered (EPG): The EPG presented to the user is filtered if it contains less information than the EPG transmission. The filter in the decoder disregards unwanted or undesirable items, e.g. networks or programmes of certain types.

full EPG: A Multiple Channels EPG which, as a broadcast type includes navigation and sorting information, or as a decoder type makes use of such information if it is available.

Hamming 8 / 4: A code for error protection as used within Teletext transmission. It allows single bit errors to be identified and corrected, and double bit errors to be detected.

header: The banner introducing the menu on the screen.

level 1.5, level 2.5, level 3.5: These are Teletext presentation levels.

menu: An arrangement of events displayed via a product's user interface, requiring user interaction.

multiple channel: An EPG broadcast type which comprises information on programmes from more than one network on which the EPG is delivered, or an EPG decoder type which can acquire and display information on programmes from more than one network regardless of the channel to which the receiver is tuned to.

navigation: The user interaction via menus leading to the selection of information.

near programme: A programme that starts during the course of the day or the next day up to at least the end of the evening's programmes.

nibble: A data entity of 4 bits.

page: In the sense of memory capacity this is space for a Teletext page or 1 kbyte.

parity: A code for error detection as used within Teletext transmission.

point-and-click: An easy way to program a TV or VCR from within the EPG by a cursor which is moved over the wished programme and a confirmation of the action is issued.

stream: A data sequence organized in a block structure as described in ETS 300 708 [1].

string: A data type covering text strings and references.

string data: This term is used to denote a combination of data fields in the EPG data structures which undergo a special encoding procedure.

structure: A data type.

Teletext: A data delivery system within television transmission.

this channel: An EPG broadcast type which comprises information only on the programmes of the network on which the EPG is delivered, or an EPG decoder type which can only acquire and display information on the programmes of the channel to which the receiver is tuned to.

3.2 Abbreviations

For the purposes of this ETS, the following abbreviations apply:

AI	Application Information (Structure)
ATS	Auto Tuning System
BI	(Data Broadcasting) Bundle Inventory
CA	Conditional Access
CI	Conditional Access Information Structure
COP	Code Of Practice
DRCS	Dynamically Redefinable Character Sets
DVB	Digital Video Broadcast
EPG	Electronic Programme Guide, also referred to as TV Guide or TV Info
HI	Helper Information (Structure)
LCD	Liquid Crystal Display
LI	Language Information (Structure)
LSB	Least Significant Bit
MI	Message Information (Structure)
MIP	Magazine Inventory Page

MSB	Most Significant Bit
NI	Navigation Information (Structure)
OI	OSD Information (Structure)
OSD	On Screen Display
OSI	Open System Interconnection
PDC	Programme Delivery Control
PI	Programme Information (Structure)
PTY	Programme TYpe
TI	Title Information (Structure)
TOP / FLOF	Means of navigation within certain Teletext pages
TV	TeleVision (set)
UI	Update Information (Structure)
VBI	Vertical Blanking Interval
VCR	Video Cassette Recorder
VPS	Video Programming System
VPT	Video Programming by Teletext
WST	World Standard Teletext

4 Introduction to TV Guide / EPG

4.1 Structure of this ETS

- Introduction:

The introduction subclause outlines the relationships between all parties involved in collecting, providing, broadcasting, formatting and presenting a TV Guide. The nature of an EPG as a database stored in a product and accessed by the user via on screen menus is also introduced. To accommodate the wide range of products and broadcasts possible with such a system the idea of "Types of EPG" is introduced.

- Presentation Techniques:

The image seen by the user is crucial to the success of the EPG. The menus and screen layouts are very far removed from the traditional image of Teletext. In short the product is now responsible for the menus on the screen layout. The user will be able to perform interactively with these menus. It is essential that the information provider be aware of possible screen layouts to ensure that the information is displayed in a pleasing and correct way. Therefore this clause outlines a "code-of-practice" between TV set manufacturer and information provider on "how the information will look".

- Installation and Consistency:

Care needs to be taken to ensure that products can handle the volume of data efficiently and accurately. Also products will probably be able only to handle one Full EPG; however more than one may be available so how to choose the right one is important.

- Scheduling:

The parties involved in providing a TV Guide need flexible and efficient means to modify (delete, insert, alter) data already stored in the receiver's EPG database.

- The Data Groups (clauses 8 to 11):

Now that the functions and requirements of the TV Guide have been listed the required data is grouped together in functional blocks, and the detailed encoding and numbering of the data takes place.

NOTE: This ETS is independent of the transport layer (according to OSI layers). EPG data will be broadcast via a Teletext data channel. The actual transportation system is laid down in ETS 300 708 [1].

4.2 How does an EPG benefit a TV / VCR user

In the era of cable / satellite TV a user can expect to receive maybe 30 channels offering perhaps more than 1 000 programmes per day. A system to allow the user to quickly and efficiently find the programme

of his choice is becoming ever more attractive. While history has shown that paper can be a very useful medium to convey programme information, simply giving information is no longer enough.

The value of an EPG to a user is to be informed of the most interesting programmes that fit his viewing criteria. Now the user can see if a programme of his choice is available within the next few days and on what channel. Or, the user can select to be informed of the best programmes by means of the rating an information provider has associated with the programme data. Similar attributes such as the language of the programme, its subtitles and audio description or the indication of the unsuitability of the programme for viewing by children can be included.

Integration into the products will also support more comfortable ways of interacting with the devices - e.g. VCRs can be programmed (also for VPS / PDC) by "point-and-click" paradigms rather than complicated manipulation of cryptic keys.

It has also been an additional goal to define a protocol that is able to allow a TV or VCR with current analogue signals to have a comparable functionality and those planned with DVB. Future products will strive to minimize the differences between signals coming from an analogue source and those from a digital one when presenting information to the user.

The EPG provides the functionality required by the viewer to select the programmes that are to be viewed and providing an easy route to transfer this information to the TV set or Video recorder by:

- "storing" the data as a database in the TV set or VCR;

- "separating" the way the information is presented or displayed from the way in which the data is transmitted;

- allowing the viewer to selectively sort and store information according to his "preferences";

- using a pre-defined refreshing sequence so that the most critical information is always available;

- using storage in the end-product so that the viewer has instant access to information about future programmes and the network operator can reduce the bandwidth required for an optimal performance.

The EPG also provides the VPS / PDC recording pre-selection codes which can be used by receivers to perform a VPS / PDC controlled recording.

The presentation techniques used in the EPG are very critical to its success. The two extremes are:

- the set collates all the data and decides how to display the information; and
- each TV Guide provider can decide how his information is to be presented.

The main conclusion in this ETS is that a common presentation technique is required, i.e. a solution somewhere in the middle. The solution is based on a minimum OSD requirement of Level 1.5 Teletext. Displays that can be enhanced through Level 2.5 and 3.5 Teletext to full bit-mapped image based systems.

However, a general purpose OSD template has to be used. This is the subject of clause 5.

By using a general purpose template it will be possible for:

- TV Guide providers to influence the layout and create their own identity;
- set makers to offer advanced OSD and powerful sorting techniques;
- viewers to obtain a standardized, consistent interface within one product.

4.3 Types of EPG

To allow a range of broadcasts and products the notion of "Type of EPG" is introduced.

There are three possible types of EPG available from all these combinations:

- This Channel = The User gets a this channel EPG;
- Multiple Channel = The user gets a multiple channel EPG;
- Full EPG = The user gets a Full EPG (Multiple Channel plus Navigation).

Table 1: Types of EPG

	This Channel Service	**Multiple Channel Service**	**Full EPG Service**
Sets with small memory	This Channel	This Channel or Multiple Channel	This Channel or Multiple Channel or Full EPG
Sets with sufficient memory	This Channel	Multiple Channel	Full EPG

The type of EPG that a user gets depends on the transmitted database and the receiving equipment. The above table gives a simple presentation of what the user can get. The user can never get more than what the service includes or what the receiver can decode.

NOTE: Refer to annex H and clause 7, for the description and use of TV programme information from normal Teletext service within EPGs.

4.4 EPG data transmission

Supplying the information in the form of data rather than the traditional visual text information will allow new powerful sorting and display techniques. These techniques will enable users to find the programmes they want and with the right amount of background information. A database is maintained within the product with specially encoded information. Viewers can access this information for display according to their wishes, guided by the information and style of the received data.

A service will include data for its own network's programmes, or a service will include data about its own and other networks' programmes. In any case, the data in the EPG is always formatted in the same way.

The data is sent invisibly to the viewer e.g. via the Teletext data channel (as hidden pages / packets as described in ETS 300 708 [1]). In this case EPG data has to co-exist with other Teletext transmissions.