User Requirements for Cable and Satellite Delivery of DVB Services

including

Comparison with Technical Specifications

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1. INTRODUCTION

The intention of this document is to outline how the important commercial and technical parameters of a digital broadcasting system for use by Satellite and Cable broadcasters and system operators have been met by the DVB-S (ETS 300421) and DVB-C (ETS 300429) technical standards. Throughout the document, the left-hand column gives the requirement stipulated by the Cable and Satellite Commercial Module, whilst the right-hand column describes the solution provided by the DVB specifications. The document has been divided into Sections describing those system aspects that have been standardised (Sections 2 and 3) as well as other aspects that are considered to be beyond the scope of mandatory standardisation but are nevertheless important (Sections 4 and 5).

1.1 Digital Broadcasting includes video services, audio services and data services as presently known and as may evolve.

The potential applications of digital broadcasting are recognised to be numerous, and whilst it is not possible to consider the requirements for all future developments, care has been taken to avoid the exclusion of new applications such as interactive services.

In the context of cable, note has been taken of the different transmission technologies and architectures of the networks, and of the different transmission media (e.g. microwave transmission, coaxial cable, optical-fibre) used to feed the programmes to the cable head. Re-transmission on terrestrial networks has also not been excluded (user requirements for primary transmission on terrestrial networks are the responsibility of the DVB Terrestrial Commercial Module).

1.2 The target date of service for the first satellite-delivered Digital Broadcasting services is to be no later than mid-1995. Cable and SMATV distribution of these services should occur at the same time.

In order to meet the 1995 service date, a draft Specification was prepared by the the DVB Technical Module and, with the agreement of the Cable and Satellite Commercial Module, submitted via the Steering Board to EBU/ETSI JTCDT to progress the creation of European Telecommunication Standards.

ETS 300421 specifies source coding and multiplexing using ISO/IEC 13818 (MPEG-2). It also includes specifications for channel coding and modulation for satellite and cable delivery systems which have been developed by the Technical Module. The specifications have been defined to allow maximum commonality between media. They also take into account the price and time constraints

	which are essential to the successful launch of digital broadcasting services.
1.3 There should be as much commonality as possible between conditional access systems.	*It has been recognised that there is significant benefit in adopting a common scrambling technique and a Common Scrambling Algorithm has been agreed. To minimise the likelihood of piracy, the technical details of the scrambling algorithm will be made available only to bona-fide users, and upon signature of a Non-disclosure Agreement. Different encryption systems are permitted for commercial reasons. A Common Interface is being standardized at CENELEC which would permit all proprietary Conditional Access elements to be placed in a module external to the IRD.*
1.4 For DTH satellite transmission the requirements apply only to applications involving one uplink per transponder in order to allow the use of dish antennas as small as possible for DTH reception.	*The requirements have been applied only to applications involving one uplink per transponder.*
1.5 The introduction of digitally modulated signals on existing cable and SMATV networks should be possible with minimal additional investment to adapt the network infrastructures, and with minimal disturbance of present analogue services.	*The need to minimise additional investment and minimise the disturbance of existing services has been kept in mind during the development of the DVB Specification.*
1.6 The target retail price of a complete DTH package (consumer dish and receiver/decoder) and of the corresponding consumer equipment for Cable, SMATV or MMDS applications should be less than 600 ECUs at time of introduction and should be less than 350 ECUs within 2 years of introduction. Similarly the target price of head-end equipment, for use in SMATV applications to perform the modulation conversion required by the distribution system, should not exceed 2500 ECUs at the time of introduction (including dish) and should be less than 1500 ECUs within 2 years of introduction.	*Although it is difficult to give a specific figure for the actual price of DTH or head-end equipment, no manufacturer has indicated that the specified targets are not achievable.*

2. MANDATORY REQUIREMENTS: SOURCE CODING

2.1 Video source coding should be as specified in MPEG-2.

Video source coding conforms to the Main Profile at Main Level of ISO/IEC 13818-2 (MPEG-2 video). The video bit-rate may be up to 15 Mbit/s and the full-screen luminance resolution may take one of 5 values from 352 pixels by 288 lines to 720 pixels by 576 lines. Further details are given in Chapter 3 of A001, "Implementation Guidelines for the use of MPEG-2 Systems, Video and Audio in Satellite and Cable Broadcasting Applications in Europe", and also in ETR 154. The video quality is dependent on the bitrate and resolution chosen by the broadcaster, and may range from about "VHS" quality to about "studio" quality (i.e. close to that of an ITU-R Rec.601 source).

2.2 The system should support 4:3 and 16:9 picture formats, including identification information about the picture format and the use of dynamic pan vectors.

The system supports both 4:3 and 16:9 picture formats, which are signalled by the aspect_ratio_information parameter in the MPEG-2 video bitstream as specified in A001 and ETR 154. Dynamic pan vectors and up-sampling are used to allow a 4:3 monitor to give a full-screen display of a selected portion of a 16:9 coded picture with the correct aspect ratio. The MPEG-2 video syntax allows one pan vector with a resolution of 1/16 pixel for every video frame.

2.3 Audio source coding should be as specified in MPEG layer II (MUSICAM).

Audio source coding conforms to either Layer I or Layer II of ISO/IEC 13818-3 (MPEG-2 audio), with the use of Layer II being recommended. In the case of Layer II coding, the bitrate may take one of 14 values in a range from 32 to 384 kbit/s. Further details are given in Chapter 4 of A001, "Implementation Guidelines for the use of MPEG-2 Systems, Video and Audio in Satellite and Cable Broadcasting Applications in Europe" as well as in ETR 154. The audio quality is dependent on the bitrate and audio mode chosen by the broadcaster, and may range from commentary-quality mono to full-quality 5-channel surround sound (although some

IRDs may be able to decode only the basic stereo information from a surround-sound transmission).

2.4 The overall differential sound-video delay in a digital television transmission chain should be kept below the level of perceptibility. Provision should be made in the conditional access system to cope with any differential sound-video delay introduced by the encryption/decryption elements, such that the total delay is kept below the threshold of perceptibility.

The audio and video timing is specified by "timestamps" in the MPEG-2 Transport Stream, in conformance with ISO/IEC13818-1 (MPEG-2 Systems). The overall differential audio-video delay may be kept well below the level of perceptibility due to the fine granularity of the timestamps (approximately 40ns). No additional differential delay should be introduced by a conditional access system which is applied at the Transport Stream level.

3. MANDATORY REQUIREMENTS: SYSTEM MULTIPLEX

3.1 It should be possible to transmit separate data streams (as defined in MPEG-2), associated to a TV service or not, for a wide variety of applications.

The MPEG-2 Transport Stream, as defined in ISO/IEC13818-1 (MPEG-2 Systems), is used to provide a flexible packet multiplex of up to 2^{13} different elementary streams which may be related or unrelated. These data streams may include video, audio, conditional access authorisations, teletext, teletext subtitles, general data broadcasting (e.g. computer software), high quality still pictures etc. The configuration and linking of the elementary streams into TV services is achieved by the use of "tables". The only additional constraint on the number of such services is the available data capacity in a particular transmission medium.

3.2 It should be possible for broadcasters or system operators to reassign the configuration of services dynamically as required to meet their instantaneous needs. Decoders should be able to follow such changes without manual intervention by the user.

It is possible to dynamically re-assign the configuration of services and automatically convey such information to the IRD by the use of the MPEG-2 Program Specific Information (PSI), as defined in ISO/IEC13818-1, augmented by DVB Service Information (SI) defined in the draft standard prETS 300468.

3.3 The multiplex system should support packetised data transmission in order to allow simple decoding in the receiver.

The multiplex supports packetised data transmission based on 188 byte packets. It is possible to decode one particular data stream without having to decode the entire multiplex.

3.4 The multiplex system should allow for easy extraction and insertion of services or service components at the multiplex level (within the constraints of the total system capacity). In particular it should be possible to recombine services from various media within a new multiplex without needing to demultiplex all the services and without source decoding.

The multiplex allows the extraction or insertion of services or service components at the multiplex level without needing to demultiplex all the services and without source decoding. However, timestamps will generally need to be re-calculated. If it is necessary to transfer from one medium to another at the lowest possible cost then remultiplexing can be avoided, e.g. by selecting a satellite transmission system which is readily transcoded to SMATV, Cable systems or MMDS.

3.5 The use of a conditional access system (whether standardised or not) should always be possible and the necessary data streams, including service information, should be available. It should be possible to apply conditional access to each individual service component. It is implicit that a broadcaster remains able to transmit any service or service component in unscrambled form (always assuming that rights to broadcast to the whole potential coverage area have been secured). Any receiver/decoder, which is enabled to receive a scrambled service, must also be enabled to receive any clear service.

Conditional access may be applied to either the components of a service, the service itself, a bouquet of services or the entire network. Scrambling control fields in the Packetised Elementary Stream (PES) packet header and Transport Stream (TS) packet header have been defined so that a value of '00' indicates no scrambling of the packet payload.

3.6 It should be possible to scramble an individual data stream at any convenient point in the transmission chain, in particular either before or after the multiplexing process.

Scrambling may be applied either at Packetised Elementary Stream level (prior to multiplexing) or else at Transport Stream level (after multiplexing).

3.7 The multiplex system should provide maximum commonality for different transmission media (satellite, cable, SMATV, terrestrial and MMDS) and should facilitate easy conversion from one medium to another with minimum processing.

The multiplexing system is common across different media and there should be minimal processing involved in converting from one medium to another at the same bit-rate. Synchronisation is achieved by use of explicit timestamps which remain valid after translation between media (unlike synchronisation mechanisms which rely on implicit information from the multiplex framing structure).

4. RECEIVER/DECODER FEATURES

This section describes the features of consumer-type integrated receiver/decoders (referred to as "IRDs"). These features are considered to be beyond the scope of mandatory standards, but features ranked as primary should be regarded as those where there is great benefit to users or manufacturers in reaching common agreement on implementation.

Primary Receiver/Decoder Features

4.1 IRDs should be able to select either 16:9 or 4:3 display mode either by manual selection or by responding to the transmitted status signal. In case of 16:9 transmission, receivers should be able to produce a 4:3 picture.

Both formats should preferably be transmitted with the full number of active lines (576). In the case of 16:9 transmission, the option of dynamic 'pan' vectors should be available for signalling the portion of the 16:9 picture to be displayed on a 4:3 TV set display (horizontal start position signalled, vertical start position always zero).

All Baseline IRDs support at least 4:3 and 16:9 picture formats, which are signalled by the aspect_ratio_information parameter in the MPEG-2 video bitstream as specified in A001 and ETR 154. IRDs may support, in addition, 2.21:1 aspect ratio as an optional feature.

All formats may be transmitted with either 352 or 576 active lines and all Baseline IRDs support the use of dynamic pan vectors and up-sampling to allow a 4:3 monitor to give a full-screen display of a selected portion of a 16:9 coded picture with the correct aspect ratio. The pan vector is transmitted every video frame and has a resolution of 1/16 pixel for the horizontal component. When no pan vectors are present in the transmitted bitstream, the central portion of the widescreen picture is displayed. The transmitted vertical component of the pan vector is always zero.

4.2 A minimum transmitted system audio capacity of 4 stereo or 8 mono sound channels is required. IRDs should be able to select one required TV-related sound channel (mono or stereo) or one required radio channel (mono or stereo) from within this capacity.

The MPEG-2 Transport Stream, as defined in ISO/IEC13818-1 (MPEG-2 Systems), is used to provide a flexible packet multiplex of up to 2^{13} different elementary streams which may be audio, video, teletext, conditional access authorisations, etc. The only additional constraint on the number of such services is the available data capacity in a particular transmission medium. There is therefore no difficulty in transmitting 4 stereo or 8 mono sound channels for each TV service. IRDs may select one required TV-related sound channel (mono or stereo) or one required radio channel (mono or stereo) from within this capacity.

4.3 IRDs should include advanced teletext facilities based on the European Teletext System including the capability of providing high quality graphics, subtitles (in one of at least 8 languages) and similar services.

A standard for conveying ITU-R System B Teletext in DVB bitstreams has been developed; document prETS 300472 gives details. The support for this facility is optional in the IRD as it is recognised that it is likely to be superseded by more sophisticated future on-screen display systems.

4.4 IRDs should use standardised interfaces for connection to peripheral equipment. This defines that PERITEL, RS232 or similar sockets should be used, rather than the development of a new plug and socket, for DVB applications.

The advantage of using common interfaces has been recognised and the DVB-TM Ad-hoc Group on Physical Interfaces for IRDs has been set up to produce specific recommendations. A list of IRD interface options, none of which is mandatory, has been compiled in document TM 1326 rev.1. Wherever possible, reference is made to existing standards of IEC or CENELEC, or to draft standards which are known to be in an advanced state of development.

4.5 IRDs should be able to utilise transmitted service information to facilitate user-friendly programme selection and system operation. This information specifies programme type, programme and service schedules, language, price, next transmission, parental rating etc.

Service Information data for automatic receiver configuration is specified in ISO/IEC13818-1 (MPEG-2 Systems), as Program Specific Information (PSI). The DVB Service Information (SI) draft standard prETS 300468, adds complementary data to aid automatic tuning of IRDs, and to provide additional information intended for display to the user. Although it is expected that Electronic Programme Guides (EPGs) will be a feature of digital TV transmissions, their definition is outside the scope of SI, although data contained within the SI could be used as a basis for an EPG.

4.6 IRDs should be able to respond to transmitted VCR-dedicated information (eg. record inhibit, Programme Delivery Control information etc).

The IRD itself would not normally be expected to respond to VCR-specific information. However, if the IRD has a digital interface, this will not alter any VCR-specific information (such as the copyright field) before passing it to an external VCR.

4.7 Random access to channels should be possible and IRDS should provide fast "channel hopping" facilities; the service acquisition time for all services should be as small as possible (typical target less than 0.5 seconds).

The total "channel hopping" time is dependent on a number of factors including the CA system and the random access time for the video decoding. With appropriate choices, it is possible to achieve an average "channel-hopping" time between services in the same multiplex of less than 0.5 seconds.

	However, it should be noted that other considerations may conflict with this requirement. For example, increasing the frequency of video sequence headers and I-frames will reduce the video decoder's random access time, but it will also reduce the efficiency of the video compression process.

Desirable Optional Features

4.8 IRDs should include a modem for connection to a public telephone network or cable telephone network.	*A PSTN modem interface is included in the list of interfaces for the DVB IRD specified in TM 1326 rev.1.*

Additional Optional Features

4.9 IRDs should be able to provide 5 channel surround sound facilities (left front, right front, left rear, right rear, centre/dialogue).	*The audio source coding conforms to ISO/IEC13818-3 (MPEG-2 audio) and may contain up to 5 channels of surround sound plus a low frequency (less than 100Hz) channel. All Baseline IRDs will be capable of decoding MPEG-1 single channel, MPEG-1 dual channel, MPEG-1 joint stereo, MPEG-1 stereo and at least the extraction of a stereo pair from MPEG-2 multichannel audio. Further details are given in Chapter 4 of A001, "Implementation Guidelines for the use of MPEG-2 Systems, Video and Audio in Satellite and Cable Broadcasting Applications in Europe" and ETR 154.*
4.10 IRDs should be optionally capable of simultaneously decoding additional services in addition to the main TV service.	*This option is available to IRD manufacturers, although it will necessarily increase implementation costs.*
4.11 IRDs should include a data output port.	*Data output ports are included in the list of interfaces for the DVB IRD specified in TM 1326 rev.1. These include a data signal output (e.g. for interconnection to a PC at relatively low data rates) and a general purpose digital output interface capable of conveying a MPEG-2 Transport Stream multiplex. Where such Transport Streams are made available, care needs to be taken that security of the CA system is not compromised.*

4.12 IRDs should be designed so as to be suitable for compatible upgrading (eg. to more advanced algorithms, to more sophisticated SI techniques) in a modular fashion.

It is possible for IRDs to be designed in a modular manner.

4.13 The IRD should be designed with an interface to be suitable for connecting a digital terrestrial receiver to the decoder.

It is possible for IRDs to include an interface for connecting a digital terrestrial receiver to the decoder.

5. REQUIREMENTS FOR SERVICE INFORMATION

The purpose of this section is to define the commercial requirements for Service Information (SI) which is transmitted in digital delivery systems for television, radio and data. SI is the means by which information on the programmes and services available is conveyed to the receiver and subsequently to the end user. SI enables the end user to make choices from current programme offerings and enables the decoder to configure itself to decode the chosen programmes.

Delivery System and Marketing Independence

5.1 The SI must support transmissions on satellite, cable and SMATV. It must be extendible to other delivery systems including terrestrial and MMDS. As an option, individual SI providers may choose to use the SI data to describe analogue services which may coexist in a particular delivery system.

The SI supports transmissions across a wide range of delivery systems as it is largely independent of the transmission medium. It is possible for individual SI providers to use private data in the SI to describe analogue services, but this will not be standardised.

5.2 SI transmission format and processing in the IRD should be as independent as possible of the delivery system on which it is broadcast.

The SI transmission format and processing in the IRD is largely independent of the delivery system.

5.3 The SI must support transitions between different broadcasting delivery systems in a cost-effective way. The transition may be "seamless" where the basic time division multiplex (TDM) data is left unchanged. The delivery system transition may also be non-seamless, where the SI, and possibly the CA information in a TDM, is modified.

The SI data supports both "seamless" transitions between different delivery systems and non-seamless transitions. In the case of seamless transitions the physical tuning information for the secondary medium needs to be made available to the IRD by another mechanism.

5.4 The SI must support transmission with or without specific access conditions.

The SI supports transmission with or without specific access conditions.

5.5 The SI must cope with the fact that signals, to be redistributed by a cable network, may come from different sources, and it must allow for easy recombining of SI data coming from such different sources.

Cable networks receive and redistribute signals from many different sources including terrestrial transmissions, satellites and satellite systems on different orbital locations, telecoms links and cable links from studios etc. A particular network usually does not simply redistribute, for instance, all the services of one specific satellite system,but rather a mixture of sub-sets of the services received via different satellite systems, together with terrestrially received services and local/regional services.

5.6 It must be possible to insert SI data on a regional or local level.

5.7 Implementation of SI for cable networks must not require source decoding, or demultiplexing and remultiplexing.

Presentation

5.8 The SI display format should be independent of the transmitted SI data and sophisticated presentations should be possible, but not essential.

Although data contained within the SI could be used as a basis for an Electronic Programme Guide (EPG), the display format has deliberately not been defined. This allows the IRD manufacturers scope for presentation to the end user at various levels of sophistication and cost.

5.9 Technical aspects of MPEG-2 and the delivery system should normally be hidden from the end user.

It is possible to design the presentation to the end user so that all technical aspects are hidden.

5.10 The SI must support transmission and display in a number of languages.

The name of programmes/events and text descriptions of the programmes can be transmitted in multiple languages.

5.11 If fixed length fields or maximum length limits are made for textual information then allowance should be made for at least the following sizes:
service names
- one line of 30 characters

programme/event names
- one line of 30 characters

additional text
- two lines of 30 characters

The data is coded with a variable length structure which will support a maximum length of 252 bytes for the combination of service provider and service names. The maximum length for the combination of programme/event names and additional text is 250 bytes.

Implementation

5.12 The SI must provide all information required for the automatic and dynamic configuration of the decoder to receive the programme/event selected by the user.

The SI does provide all this information, so that the appropriate network, multiplex and set of packet IDs can be selected automatically by the user selecting a programme/event.

5.13 The SI must be based upon and compatible with the ISO MPEG-2 System layer.

The basis of the SI is the Program Specific Information (PSI) specified in ISO/IEC13818-1 (MPEG-2 Systems). The DVB Service Information (SI) draft Standard prETS 300468, adds complementary data to aid automatic tuning of IRDs, and to provide additional information intended for display to the user.

5.14 At least SI data for the minimum implementation must be transmitted in an unscrambled form and be available to all receivers.

The SI tables are required to be transmitted in unscrambled form except the EIT Schedule Table. This table is not required for the minimum implementation.

5.15 The SI must allow for information on services in other multiplexes to be provided on any multiplex, irrespective of the delivery system. Alternatively the information describing a multiplex may be restricted to that multiplex. Linkage information to allow access to further SI in other multiplexes should also be possible.

The SI does allow for information about services on other multiplexes and delivery systems to be transmitted in any multiplex. The SI guidelines will specify the minimum information in a multiplex.

5.16 The SI must allow for more than one Conditional Access (CA) system. The interaction of the SI with the CA system must be small.

The SI can describe multiple CA systems. The overlap is restricted to identification of the CA system, and some CA private data is also permitted within the SI.

5.17 The SI must allow the same programme, event or elementary stream to be offered by more than one CA system or more than one revision or version of a single CA system.

The SI description of multiple CA systems supports offering the same item by more than one CA system or revision of a single CA system.

5.18 The SI should allow:

- Information to be removed/inserted without difficulty
- Simple re-multiplexing (where a combination of part of one multiplex is made with part of another to form a new multiplex with new SI),
- A simple compilation process (to create or interpret the SI data format),
- Consistency between all transmitted information

The SI has been designed with these aims in mind.

5.19 The SI must allow for the provision of information about current and future programmes and/or events.

This information is transmitted in the present/following sections of the Event Information Table.

5.20 The SI must allow a mechanism to be provided to indicate the countries in which a service is intended to be received.

The country_availability_descriptor provides this function. The country availability may be indicated by bouquet or by service.

5.21 The SI should allow multiple categorisation of events including categories for parental control.

A content_desciptor provides this function, with a 2-level hierarchical categorisation. The parental control is provided by a parental_rating_descriptor which indicates the minimum intended audience age.

Performance and support requirements

5.22 The minimum implementation of SI data must be transmitted in a form requiring little processing power (hardware and software) and memory in the IRD.

The SI has been designed with this aim in mind.

5.23 The minimum implementation of SI data must be transmitted in a form requiring low transmission overhead.

The overhead depends on the transmission frequency, but is typically very small for the minimum implementation.

5.24 The acquisition time for any SI data required for service acquisition when "channel hopping" within a delivery system must be controllable within defined limits by the multiplex originator/builder with a nominal target of 0.1 second. This figure is intended to make the overall service acquisition time as small as possible (typical target less than 0.5 second).

The acquisition time for SI depends on the transmission frequency. The SI guidelines will indicate the recommended transmission rates. The nominal target of 0.1 second for the SI is readily achievable.

Features

5.25 The SI must allow for a mechanism to automatically switch the IRD to another programme or event at any time. The switch can be on a temporary basis (e.g. an interstitial break) or longer (e.g. the next event). The switching should be accurate to within one TV frame if possible.

Automatic switching is achieved by modifying the packet ID references in the Program Map Table of the PSI. The switching accuracy depends on the accuracy of time of transmission of the new PMT section, and on the response time of the IRD.

5.26 The SI must allow sharing of bitstreams, permitting the same programme, event or elementary stream to be offered by more than one bouquet operator, SMS operator or broadcaster.

The SI can refer to the same bitstreams with multiple descriptions.

5.27 The SI must be capable of expansion in the range of descriptions to cover new services in the future (for example, banking, shopping or NVOD). The use of new features in transmissions must not cause malfunctions of first generation IRDs.

The SI data structure allows future additions of new tables and descriptors. These will be ignored by first generation IRDs.

5.28 The SI must allow the implementation of the following receiver functions:

- to decode a programme/service or event
- to list the available services or events
- to service- or event- hop
- to select an event for future viewing or automated recording (assuming that the information on the event is available sufficiently far in advance). This selection should be accurate to within one TV frame, if possible. This mechanism can be used to create 'virtual' services
- to select one of multiple language elementary streams (e.g. audio or subtitles).

These functions are supported. The creation of virtual services are assisted by running status bits for each event. The switching accuracy depends on the timing of the transmitted SI, and on the response time of the IRD.

5.29 The SI must allow for means to be provided of obtaining authorisation information regarding a programme, service or event. This may be in the form of direct entitlement information, or as a minimum, details of the SMS operator(s).

The SI offers a number of private mechanisms for this purpose.

5.30 The SI must allow interaction with CA system(s) in order to obtain available entitlement information.

Entitlement information is obtained from the ECM and EMM streams. The SI provides the association between the programmes/events and the ECM streams.

5.31 In addition to the basic SI, some broadcasters may wish to transmit more detailed and/or longer term information than is provided by this basic SI system. Such information would be transmitted within the SI or as proprietary data which would be processed by specific EPG software in the IRDs.

The SI provides Event Information Table schedule sections for this purpose. It allows schedule information to be transmitted within the SI data. The SI can also point to private EPG streams.

5.32 The SI should allow the transmission of linkage information which indicates:
a) that additional (non-SI) information is available and where it is located, and
b) the type of information.

Linkage information to Information Services , EPGs, and CA replacement services can be provided in the SI data.

MINIMUM IMPLEMENTATION

5.33 The minimum implementation of an SI system should include the transmission of the following information (as an example for satellite):

a) Quasi-Static Information (infrequently transmitted, e.g. every 10 secs)

item:	example[1]:
name of service	"THE COMPLETE MOVIE CHANNEL"
name of bouquet provider(s)	"KALEIDOSCOPE"
name of service/program provider	"FILMNET"
delivery system name	"EUTELSAT II-f9"
satellite position	-16.30 (=16.30 West)
frequency	11757.50 (MHz)
polarisation	Vertical
service/program type	TV
territorial availability[2]	NL,B,N,DK,S,FIN,P,D,UK

b) Dynamic Information[3] (frequently transmitted, e.g. every 2 secs) for the current event and for the next event:

name of the event[4]	(0 to 30 characters)
additional text[4]	(0 to 60 characters)
context[5]	Movies, sport
picture format	16:9, no pan vector
available languages	English, German, French
mode of each language	mono, stereo, surround,etc.
available subtitles	Swedish, Danish, Norwegian
current date/time UTC	06//03//96 18/28/16
event duration	01:26:15
start date/time	06/03/96 18:29:16
CA status	free
additional information pointer	data location for further information

[1] Text strings are enclosed in quotation marks: "EXAMPLE"
[2] All territories of the world in any relevant combination.
[3] For all of the above dynamic information, a value for void or unknown information must be available.
[4] In each available audio language and/or subtitle language.
[5] Maximum 100 categories with multiple flaggings permitted, with some reserved for future usage. Flags should indicate that parental control is indicated with 8 levels suggested.

6. GLOSSARY OF TERMS

Term	Description	Example(s)
Delivery System	The physical medium by which one or more multiplexes is transmitted.	Satellite transponder, Wide-band coaxial cable, fibre optics
Delivery System Operator	An organisation which provides or operates the delivery system for one or more networks.	SES, France Telecom, Winchester Cable, Hughes Communications
Network	A collection of MPEG multiplexes transmitted on a single delivery system.	All digital channels on a specific cable system.
Bouquet	A collection of services marketed as a single entity.	Canal Satellite, Telepiu, Sky Multichannels
Service	A sequence of programmes under the control of a broadcaster which can be broadcast as part of a schedule.	SVT1, RAI Uno, TV Asia, Hector, CNN Text.
Broadcaster (= Service Provider)	An organisation which assembles a sequence of events or programmes to be delivered to the viewer based upon a schedule.	Tele 21, BSkyB, RAI
Programme	A grouping of one or more events under the control of a broadcaster.	Eurovision Song Contest, The Simpsons
Event	A grouping of elementary broadcast data streams with a defined start and end time.	Advert, News Flash, First part of The Simpsons.
Subscriber Management System (SMS) Operator	An organisation which provides subscriber management services and issues viewer entitlements for access to programmes and/or services in exchange for payment.	France Telecom, TV Extra, Viasat, Westminster Cable
Multiplex	A stream of all the digital data carrying one or more services within a single physical channel.	
Service Information	Digital data describing the delivery system, content and scheduling/timing of broadcast data streams etc. It includes MPEG2 Program Specific Information together with extensions.	
Conditional Access System	A system to control subscriber access to services, programmes and events.	Videoguard, Eurocrypt
Component (elementary stream)	One or more entities which together make up an event.	Video, Audio, Teletext
Virtual service	A new service constructed in the IRD by assembling programmes, events and/or elementary streams from separate services.	