

Audiovisual systems — Interactive text transmission system (ITTS)

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British Standard

ICS 33.160.99

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Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, the EN title page, pages 2 to 46 and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

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English version

Audiovisual systems Interactive text transmission system (ITTS)

(IEC 61866:1997)

Systèmes audiovisuels — Système de
transmission de textes interactifs (ITTS)
(CEI 61866:1997)

Audiovisuelle Systeme — Interaktives
Textübertragungssystem (ITTS)
(IEC 61866:1997)

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CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

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Foreword

The text of document 100C/114/FDIS, future edition 1 of IEC 61866, prepared by SC 100C, Audio, video and multimedia subsystems and equipment, of IEC TC 100, Audio, video and multimedia systems and equipment, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 61866 on 1997-10-01.

The following dates were fixed:

- latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 1998-07-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 1998-07-01

Endorsement notice

The text of the International Standard IEC 61866:1997 was approved by CENELEC as a European Standard without any modification.

In the official version, for Annex D, Bibliography, the following notes have to be added for the standards indicated:

IEC 60958 + A2

NOTE Harmonized as EN 60958:1990 (not modified) + A2:1995 (not modified).

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Introduction

Distribution and reproduction of digital sound recordings can be accompanied by text associated with the sound track. Such data can be, for instance, album and track titles, lyrics or information about artists and performers.

ITTS covers application requirements for pre-recorded media, digital broadcasting and remote controls. Several display options are supported for information readout: 21-, 2- and 1-line displays of 40 characters each, as well as a 12-character display window.

The user interface consists of displayed text and provision for direct access to information by means of related function control keys or a cursor positioned over a menu item and a SELECT function key.

Various character sets can be used in the system. Up to 40 (horizontal) × 21 (vertical) alphanumerical characters can be presented on a screen. For other fonts, like Kanji, the number of fonts that can be presented on a screen depends on the font size which is defined together with the font table.

ITTS uses the Latin-based alphanumeric character set based on ISO 8859-1 and the repertoire described in EBU Tech. 3232. Further, a font set containing graphical elements and font sets providing Japanese fonts are presently defined.

NOTE User-defined 12 horizontal × 10 vertical pixel graphics may be included as well.

Information may be presented in monochrome or in up to 15 colours. These colours are defined in a colour look up table (CLUT) and may be redefined from a palette of 4 096 colours.

Information can be accessed without delay if the ITTS decoder provides a cache memory in which the data from the medium is captured before it is needed for display. An index is applied to each transmission packet to serve this and several other functions.

1 General

1.1 Scope

The interactive text transmission system (ITTS) provides the mechanism for encoding sound associated data on prerecorded media and for the transport of such data across equipment interfaces. This International Standard defines the higher layers of ITTS, i.e. those system characteristics which are independent of the recording or interconnection medium.

1.2 Definitions and abbreviations

1.2.1 Definitions

For the purpose of this International Standard the following definitions apply:

1.2.1.1

ITTS

interactive text transmission system

1.2.1.2

ITTS packet

a data structure comprising header information plus either coded text and graphics or control and presentation commands. ITIS packets have a fixed length of 48 bytes

1.2.2 Abbreviations

The following abbreviations are introduced in the main text:

AI:	application item;
IC:	interactive command;
ICP:	interactive command present;
TCI:	text continuity index;
ICI:	instruction continuity index;
CDS:	category data start;
CDE:	category data end;
CI:	command index;

PI: packet index;
MMC: main message channel;
SMC: submessage channel;
CLUT: colour look up table;
DRCS: dynamic redefinable character set.

1.3 Presentation conventions

The following conventions are used in this standard to specify binary and hexadecimal numbers.

Where a hexadecimal code or binary code occurs in tables

- the hexadecimal code is followed by a lower case h; for example, the hexadecimal presentation for a byte containing all binary values 1 is written as FFh,
- the binary code is represented by a string of 1s and 0s. A string of 8 bits, comprised in one byte, is written in two groups of 4 bits; for example the binary presentation of a byte containing the binary equivalent of decimal 255 is written as 1111 1111.

Where a hexadecimal code or binary code occurs in running text, the code values as described above are enclosed in double quotes.

2 ITTS packet structure

2.1 Introductory remark

Text information arranged in packets according to the ITTS format can be carried by a subchannel along with audio data. ITTS packets have a length of 48 bytes: an 8 byte header and a 40 byte TEXT or DATA string.

Details on how ITTS packets are carried in the subchannel of transmission media is given in the following standards:

- amendment 2 to IEC 60908¹⁾;
- amendment 2 to IEC 60958;
- ETS300401.

2.2 ITTS packet format

The 48 bytes of an ITTS packet are grouped into the

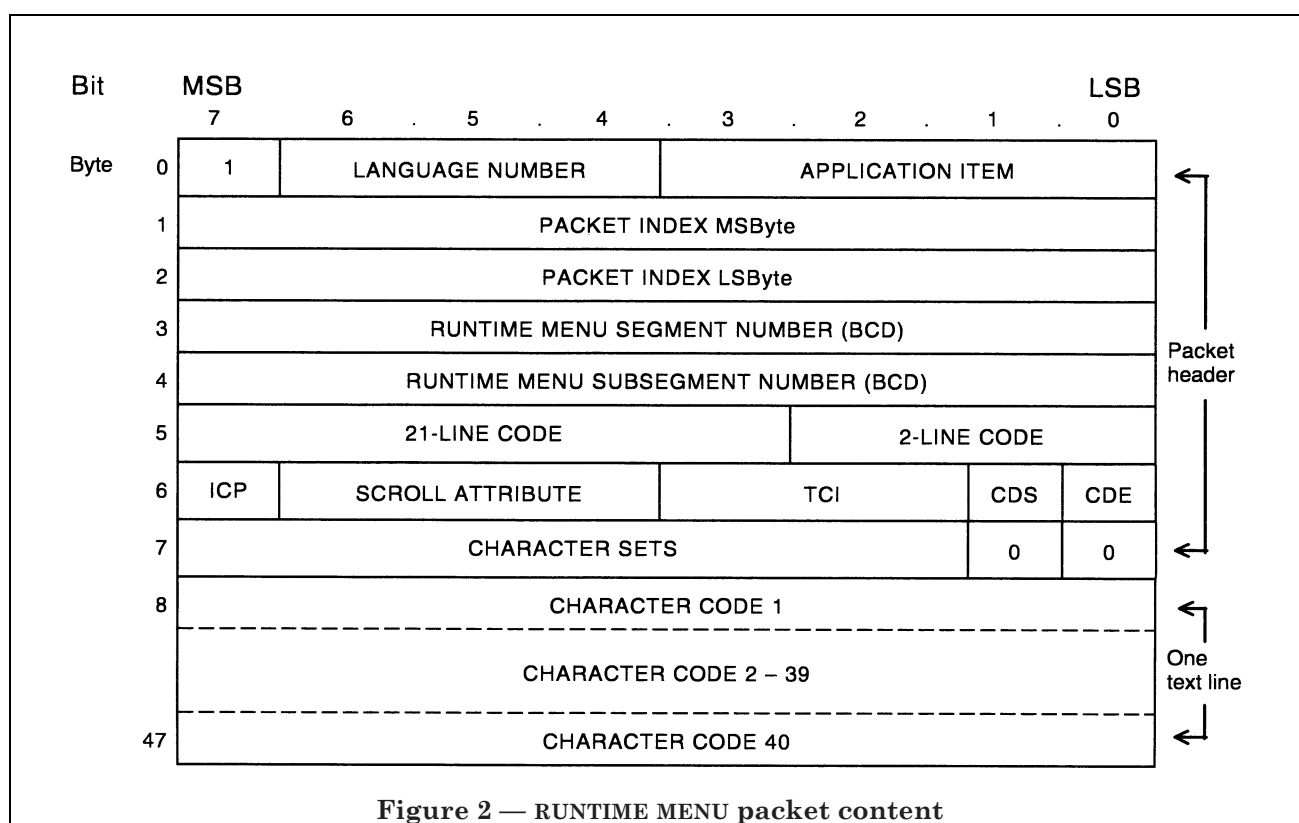
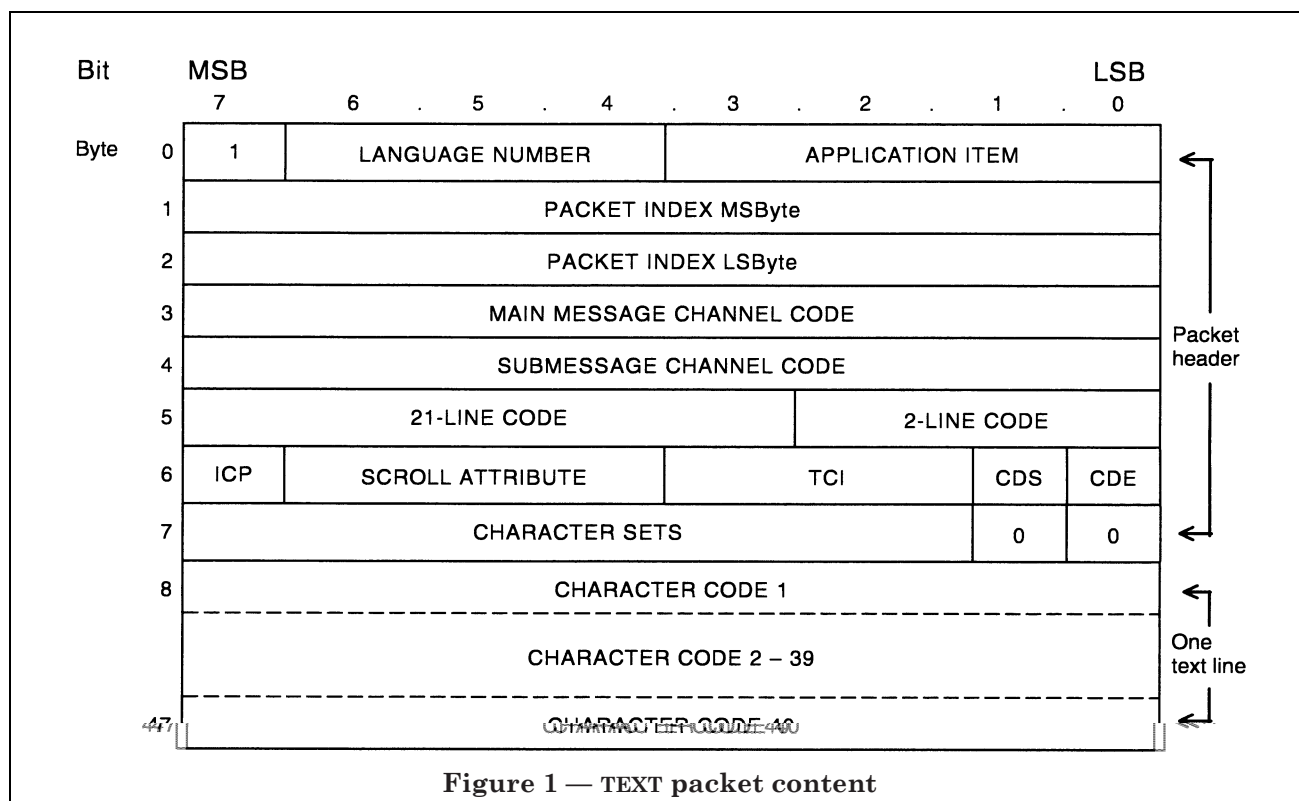
- packet-header field: bytes 0 – 7,
- data field: bytes 8 – 47.

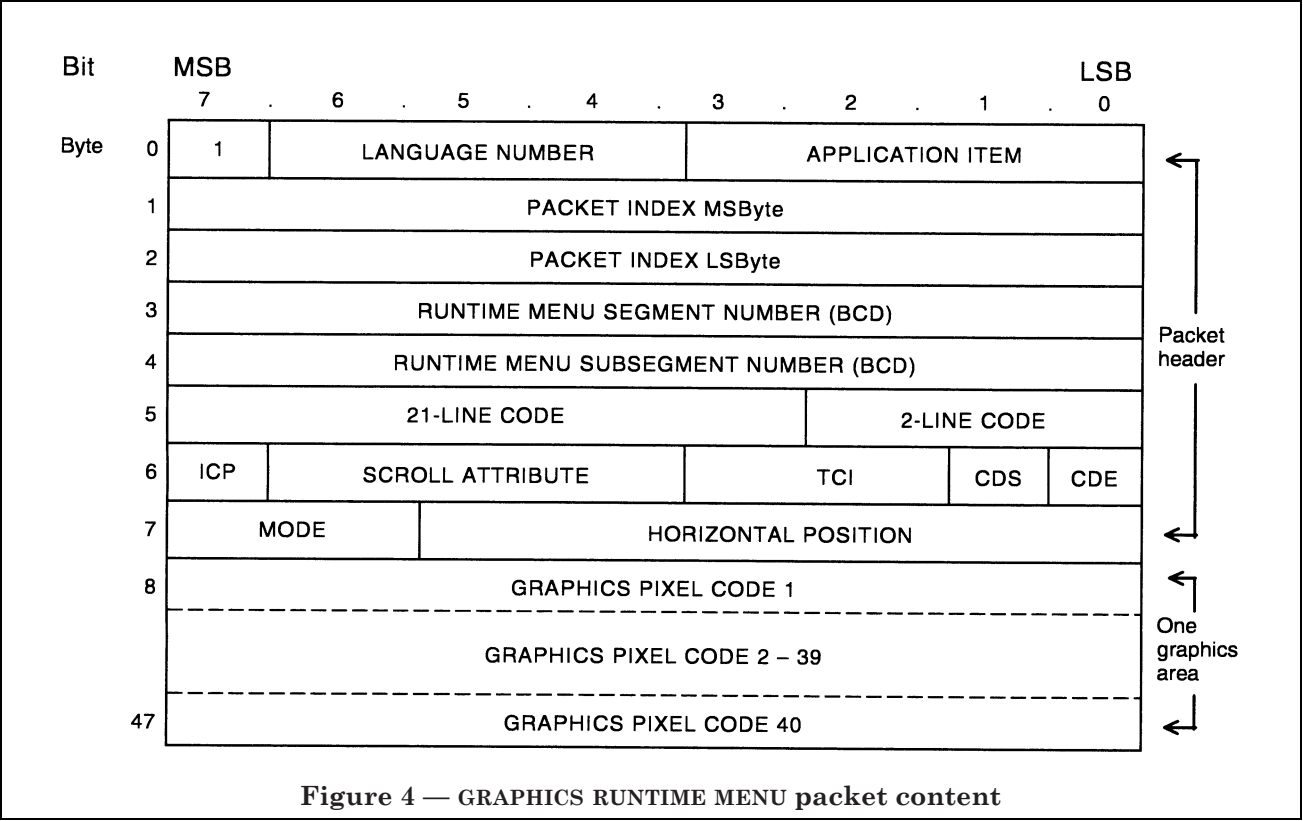
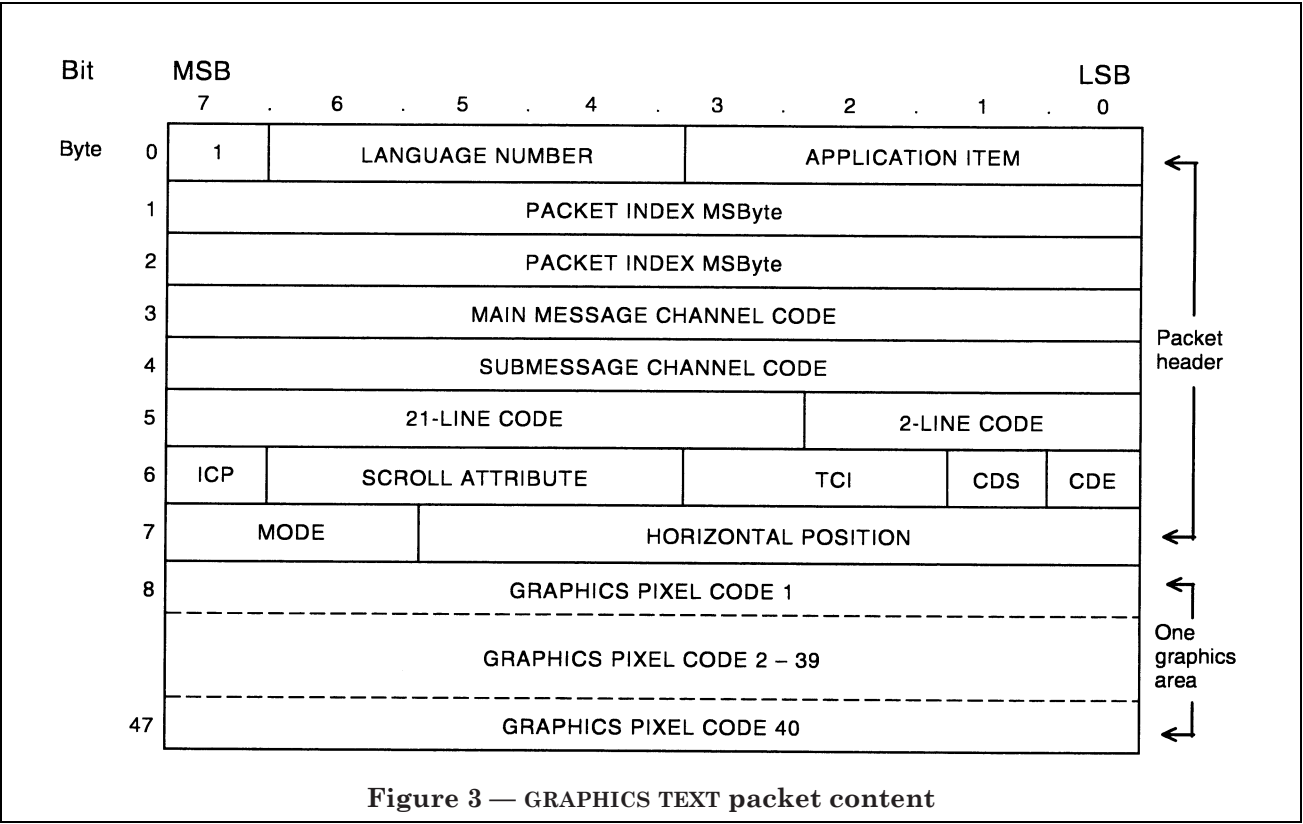
The packet content differs according to the application item code in bits 3–0 of the first packet byte. The following five packet types are defined:

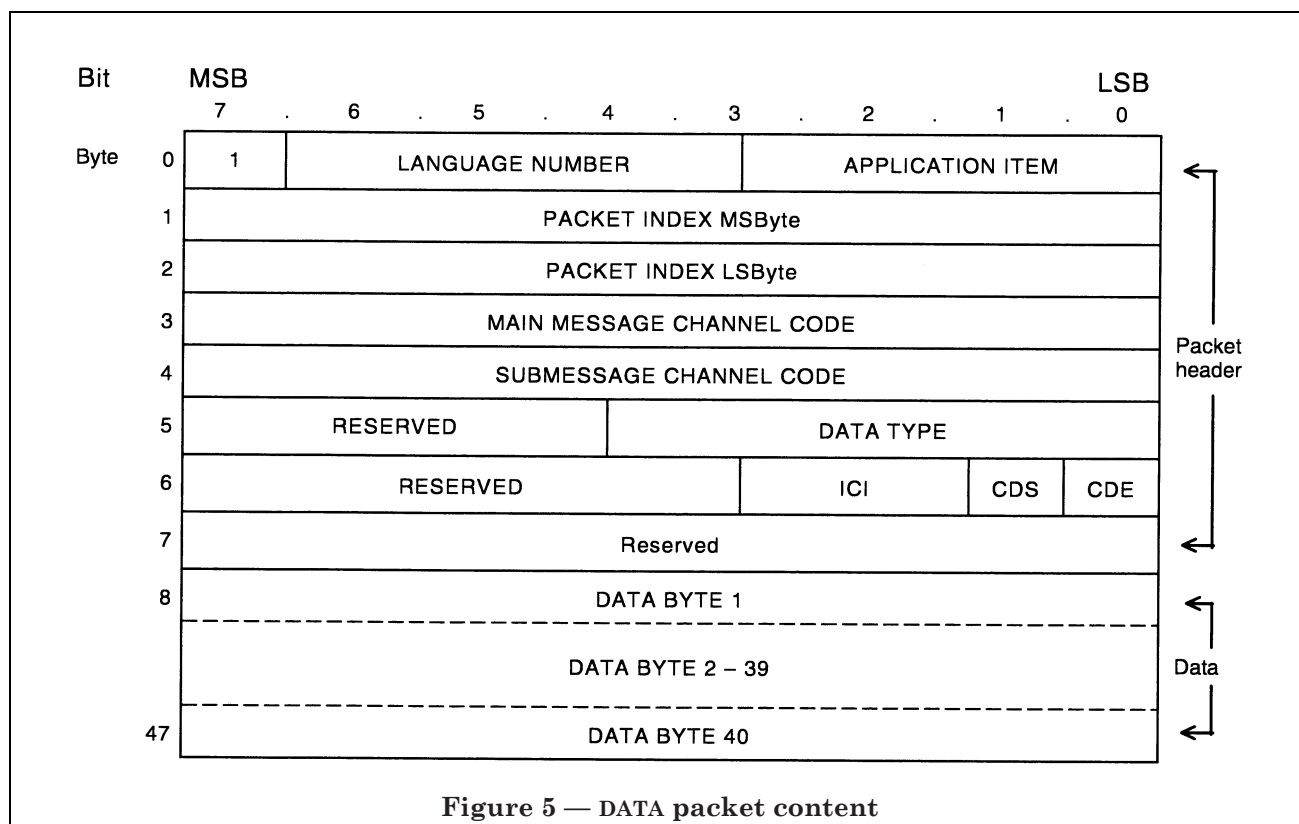
- TEXT packet;
- RUNTIME MENU packet;
- GRAPHICS TEXT packet;
- GRAPHICS RUNTIME MENU packet;
- DATA packet.

Figure 1 to Figure 5 specify the content lay-out of the packet header for each of these packet types.

¹⁾ To be published.







2.3 Packet-header field descriptions, bytes 0 – 7

2.3.1 Packet-header byte 0: language number and application item

Bit 7

0 Reserved for future use

1 Default (must be set to 1 to identify the packet format according to this standard)

Bit 6–4 = language number

654

000 Language-independent text or one language only

001 Main language, if various languages are recorded

010
*** } Additional languages
111

NOTE Text lines that are identical in all language versions need to be recorded only once if the given language number is “000”. It is recommended to apply additional languages in consecutive order.

If more than one language is applied, then the main language with code “001” shall be specified by the content provider.

Bit 3–0 = application item

3210

0000	TEXT packet for 2-line and 21-line display
0001	RUNTIME MENU packet for 2-line and 21-line display
0010	GRAPHICS TEXT packet for 2-line and 21-line display
0011	GRAPHICS RUNTIME MENU packet
0111	DATA packet.
1000	TEXT packet, also for 1-line display
1001	RUNTIME MENU packet, also for 1-line display
1010	GRAPHICS TEXT packet, also for 1-line display
1011	GRAPHICS RUNTIME MENU packet, also for 1-line display
****	All other codes are reserved

Only one packet per message channel or RUNTIME menu segment shall be specified as “also for 1-line display”.

2.3.2 Packet-header byte 1–2: packet index

The main applications for the packet indices are

- to support cache memory management for ITTS program packets;
- to control text line order when loaded into the display memory;
- to specify packets, the content of which shall not be loaded into a cache memory but displayed and/or executed immediately after passing the input filter stages of the decoder;
- to define the priority of a packet with respect to the cache memory size;
- to link DATA packet inherent commands with TEXT packet(s);
- to link DATA packets with horizontal menu text;
- to support a packet group validity check.

The packet index is carried in byte 1–2 of each packet. Rules related to the packet index are as follows:

- a packet index other than “0000h” indicates at which cache memory address the packet shall be stored;
- packets with index “0000h” shall not be loaded into the cache memory;
- textual contents of packets with index “0000h” shall be displayed immediately when occurring at the output of the language and channel filter bank;
- commands (IC) with command index “0000h” in DATA packets with index “0000h” shall be executed immediately;
- commands (IC) with command index “0000h” in DATA packets with index other than “0000h” shall be executed when the corresponding channel becomes invoked. If an IC inherent command index is equal to its packet index, then this IC can only be activated by an IC 5 command; this means such commands are not activated when the corresponding message channel becomes invoked;
- the command index of an IC shall have the same value as the packet index of the text packet to which it is linked;
- commands (IC) in a packet index sequence defined by a CDS and CDE pair shall be executed in the ascending order of packet indices and packet inherent bytes;
- the packet index “0003h” is reserved for the first packet of the main menu packet sequence of the submessage channel;
- packets with equal language, main and submessage channel specifier shall have contiguous ascending packet index values.

NOTE All data which belong to a selected language and main message channel may be loaded into a cache memory irrespective of the user's submessage channel selection. Packets which cannot be stored in the cache memory due to lack of memory capacity are retrieved as they appear in the transmission sequence of the current category display constraint.

2.3.2.1 *Reserved packet index “0001h”*

The packet with index “0001h” is reserved for a DATA packet which contains access instruction(s) for the most significant channel. Recommended applications are the super-main menu or an access instruction for a submessage channel with application-specific presentation preference. A super-main menu access instruction may replace any other contents which already exist at the same location. Packet index “0001h” inherent instructions shall only be active at decoder POWER-UP or insertion of a new program.

In program generation for prerecorded media, it is essential to take into account that instruction(s) at packet index “0001h” may become lost during post-processing or in multiple main message channel applications.

The default coding format for a packet index code “0001h” is the following:

Application item	0111
DATA type	00010
Main message channel (MMC)	0000 0000
Submessage channel (SMC)	0000 0000
CDS	1
CDE	1
IC command indices	0000h

2.3.2.2 *Reserved packet index “0002h” for default CLUT data*

A packet with index “0002h” provides a colour look up table for all submessage channels of the actual main message channel; this packet is transmitted in a DATA packet with DATA type code “00001” (see 2.4.2.1).

2.3.3 *Packet-header byte 3–4*

2.3.3.1 *TEXT, GRAPHICS TEXT and DATA packet*

The packet data stream may consist of up to 254 main message channels plus one reserved for hardware function control; 255 submessage channels for each main message channel are available. Only one main message channel is selected at a time. For pre-recorded media, the main message channel is defined by code “xxx0 0001”. Parallel channels in multiple-sector applications are uniquely accessible via dedicated coding of the three most significant bits of byte 3.

One main message channel (MMC) code is defined as belonging to all main message channels, and for each main message channel there is also a submessage channel (SMC) code to identify packets that belong to all submessage channels:

- the channel “00h/00h” shall override any other pre-selection;
- the channel “MMC/00h” shall override any submessage channel pre-selection in the selected main message channel;
- the channel “00h/SMC” shall override any main message channel pre-selection.

Decoder initial settings after power-up for language, main message channel and submessage channel are:

Language	000 and 001
Main message channel	0000 0001 (pre-recorded media)
Submessage channel	1111 1111 (main menu of this MMC)

The decoder first filters all data for packets with valid language and main message channel codes as selected.

The submessage channel filter follows the language and main message channel filter stages. The submessage channel filter output delivers the packets for display, command execution and system control as actually selected.

Packets with index “0000h” that pass the submessage channel filter are available for immediate processing and/or for display. Those that do not pass this filter are lost. Packets with index greater than “0000h” are loaded into a cache memory (if available); those that are out of the range of the cache memory are lost.

The packets belonging to one submessage channel shall be delimited by dedicated category data start/end flags (CDS/CDE) (see 2.3.5.1).

Byte 3 = main message channel code

For prerecorded media the main message channel code shall be as follows:

765

- 000 This packet is recorded on a 2-sector tape and also on 4-sector tape, for those packets which belong to channels I and II
- 010 This packet is recorded on a 4-sector tape for those packets which belong to channel I only
- 100 This packet is recorded on a 4-sector tape for those packets which belong to channel II only

43210

- 00001 End user information
- 00010 Disc jockey information

Byte 4 = submessage channel code

7654 3210

- 0000 0000 Submessage channel independent packet
- 0000 0001
**** **** } Application specific submessage channel 1–253
- 0000 1101
- 0000 1110 Language MENU packet
- 1111 1111 Main MENU packet

Reserved submessage channel codes for prerecorded media shall be as follows:

- 0000 0001 VOLUME title plus related information
- 0000 0010 RUNTIME MENU related TEXT packet
- 0000 0011 Actual RUNTIME MENU segment-related names and credits
- 0000 0100
**** **** } Major submessage channels
- 0000 1000
- 0000 1001 Lyrics, may be synchronized
- 0000 1010
**** **** } Supplementary submessage channels
- 1001 1111
- 1010 0000
**** **** } Reserved
- 1111 1011
- 1111 1101 Reserved (for identification of recording equipment on consumer-recorded media)
- 1111 1110 Language MENU
- 1111 1111 Main channel MENU

2.3.3.2 RUNTIME MENU and GRAPHICS RUNTIME MENU packet

Byte 3 = RUNTIME MENU segment number 0–99 (BCD) or medium specific lead-in/out area code

Byte 4 = RUNTIME MENU sub-segment number 0–99 (BCD) or medium specific lead-in/out area code

No interactive commands (ICs) shall be appended to packets with application item code “0001”, “0011”, “1001” or “1011”.

NOTE The RUNTIME MENU segment specifier in bytes 3 and 4 of RUNTIME MENU packets (i.e. application item code “0001”, “0011”, “1001” or “1011”) may also serve for a GOTO_a_RUNTIME_MENU_segment hardware control function. This makes the transmission of separate commands superfluous by maintaining the RUNTIME MENU segment inherent SELECT and GOTO functions. The decoder may invoke a select function for the RUNTIME MENU segment specified by the bytes 3 and 4 if the received packet is coded with packet index “0000h”.

In case an application contains packets other than RUNTIME MENU packets within the RUNTIME MENU packet sequence, then these packets shall be coded as follows:

- packet byte 3 XXX0 0001 (pre-recorded media);
- packet byte 4 0000 0010 (RUNTIME MENU related TEXT packet).