RECOMMENDATION ITU-R BT.1207-1*

Data access methods for digital terrestrial television broadcasting

(Question ITU-R 31/6)

(1995-1997)

The ITU Radiocommunication Assembly,

considering

a)   that many kinds of service signals, from high-speed video signals to low-speed data signals may be multiplexed within a channel;

b)   that multiple programme services may be multiplexed within a channel;

c)   that special care should be taken in choosing methods to access particular signals;

d)   that in many cases, particularly in the case of data services, receivers may not be required to deal with all the multiplexed signals carried by the channel,

recommends

1   that digital terrestrial television broadcasting (DTTB) systems should use the data access methods as specified in the International Organization for Standardization/International Electrotechnical Commission Standard 13818-1 (ISO/IEC Standard 13818-1). The outline of the specifications is shown in Annex 1.

Annex 1

1   Introduction

In DTTB, many kinds of television programmes, sound programmes, and data broadcasting programmes are broadcast over one channel. The indirect identification by the Program Specific Information (PSI) of ISO/IEC Standard 13818-1 should be used as the data access method which enables viewers/listeners to easily access the desired program.

Furthermore, the ISO/IEC Standard 13818-1 specifications allow the system to extend the receiver's functions for viewers/listeners, using private sections or private descriptors.

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*   Radiocommunication Study Group 6 made editorial amendments to this Recommendation in 2003 in accordance with Resolution ITU-R 44.

2   Basic data access flow in the receiver

A program is received based on the following four tables of PSI in ISO/IEC Standard 13818-1 specifications:

–   Program Map Table (PMT), which transmits the relationship among the elementary streams which constitute the program, its attribute information, and the Packet Identifier (PID) of the packet in which the program is sent.

–   Network Information Table (NIT), which transmits the information about the transmission channel in which the program is sent.

–   Program Association Table (PAT), which indicates the PIDs in which PMT or NIT is transmitted.

–   Conditional Access Table (CAT).

When the desired program is designated, the elementary streams which construct each program are received according to such a flow diagram as shown in Fig. 1 using these tables.

FIGURE 1

An example of data access flow in the receiver
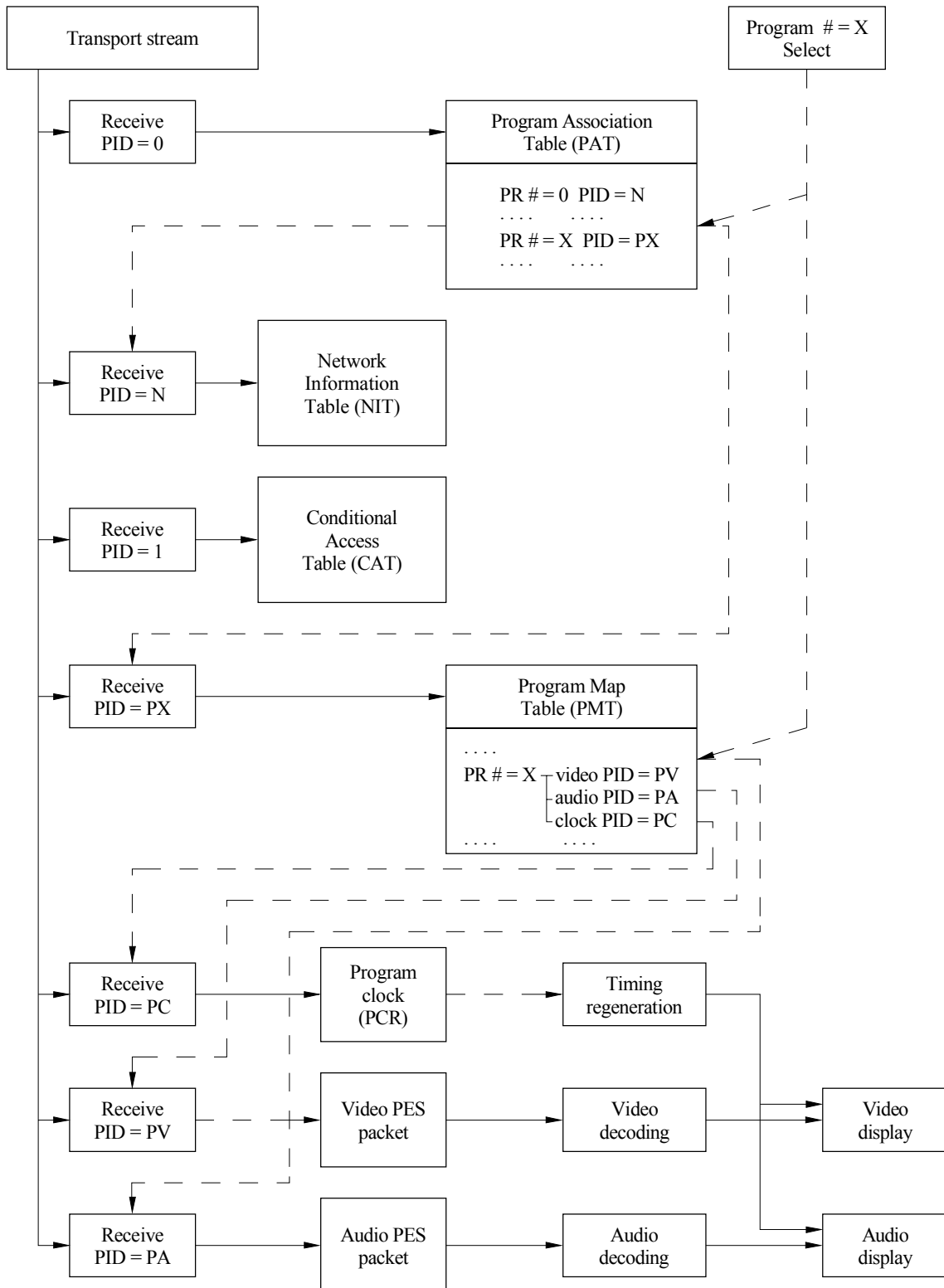
PES : packetized elementary bit stream
PCR: program clock reference

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3   Outline of the PSI of the Moving Pictures Expert Group (MPEG) specifications and the extensions for broadcasting applications

Functions of each field in the PSI of the ISO/IEC Standard 13818-1 specifications and the extensions and new definitions of descriptors for broadcasting applications are as follows. NIT indicates the service, transport ID, channel frequency, etc., in general, but it is not specified in ISO/IEC Standard 13818-1. Specifications for NIT standards and more extensions for broadcasting applications are defined and recommended in Recommendation ITU-R BT.1300.

3.1   Program Association Table (PAT)

The structure of the program association section which is used for the transmission of PAT is shown in Fig. 2.

FIGURE 2

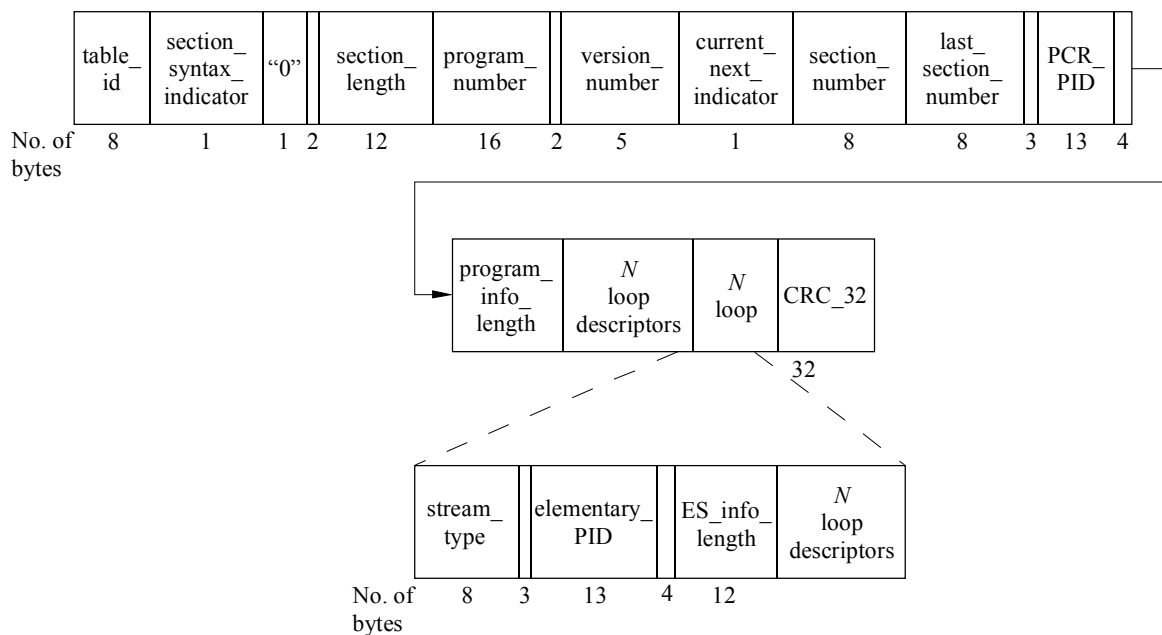**Structure of the program association section**
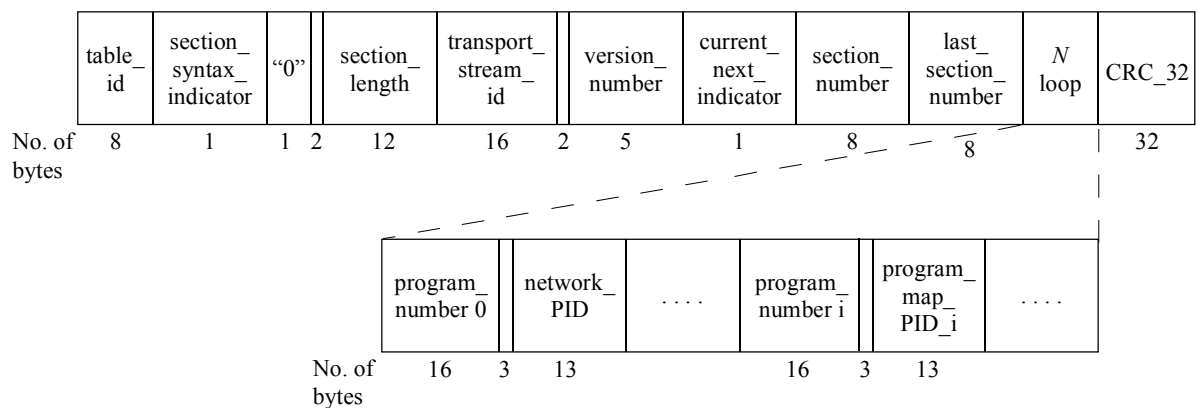
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table_id:	it identifies the content of a Transport Stream PSI section, and it is set to 0 for PAT.
section_syntax_indicator:	it is set to 0 for PAT.
section_length:	it specifies the number of bytes of the section including the CRC.
transport_stream_id:	it can be used as a label to identify this Transport Stream from any other multiplex within a network, and its value is defined by the user.
version_number:	it indicates the version number of the whole PAT.
current_next_indicator:	it indicates whether the PAT sent is currently applicable or next applicable.
section_number:	it gives the number of this section in the PAT.
last_section_number:	it gives the number of the last section of the complete PAT.

program_number: it specifies the program to which the program_map_PID is applicable. If this is set to 0 then the following PID reference is the network PID. The program_number is used as a designation for a broadcast channel, which is called program channel (program channel means a time series of broadcast programmes and a plural number of program channels are transmitted in a physical channel for the case of the multichannel system).

network_PID: it specifies the PID of Transport Stream Packets (TSPs) which send the network information table.

program_map_PID: it specifies the PID of TSPs which send the PMT applicable for the program as specified by the program_number.

CRC: it checks the error in the entire program association section.

3.2 Program Map Table (PMT)

The structure of the program map section which is used for the transmission of PMT is shown in Fig. 3.

FIGURE 3

Structure of the program map section

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table_id: it is set to 2 for the program map section.

section_syntax_indicator: it is set to 1.

section_length: it is the same as PAT.

program_number: it specifies the program to which the program_map_PID is applicable.

version_number: it is the same as PAT.

current_next_indicator: it is the same as PAT.

section_number: it is always set to 0.

last_section_number: it is always set to 0.

PCR_PID: it indicates the PID of the TSP which contain the PCR valid for the program specified by the program_number.

program_info_length: it specifies the number of bytes of the descriptors immediately following this field.

stream_type: it specifies the type of elementary stream or payload carried within the packets with the PID whose value is specified by the elementary_PID. The values are specified by a table; for example, 2 is for MPEG-2 video and 4 is for MPEG-2 audio.

elementary_PID: it specifies the PID of TSP which carry the associated elementary stream or payload.

ES_info_length: it specifies the number of bytes of the descriptors of the associated elementary stream immediately following the field.

CRC_32:   it checks the error in the entire program map section.