

## The MPEG2, DVB and ATSC system at a glance - DVB abbreviations

### **BAT**

#### **Bouquet Association Table (PID=0x11)**

Table describing a bouquet of programs offered by a broadcaster.  
Table ID 0x4A

### **CAT**

#### **Conditional Access Table (PID=0x01)**

Reference to scrambled programs, Table ID 0x01

### **CNR**

**Carrier to Noise Ratio** Indicates how far the noise level is down on carrier level

### **COFDM**

#### **Coded Orthogonal Frequency Domain Multiplex**

Up to 6817 single carriers 1.116 kHz apart are QAM-modulated with up to 64 states. "Coded" means that the data to be modulated has error control. Orthogonality means that the spectra of the individual carriers do (almost) not influence each other as a spectral maximum always coincides with a spectrum zero of the adjacent carriers. A *single frequency network (SFN)* is used for the actual transmission.

### **Constellation Diagram**

Way of representing the I and Q components for QAM or QPSK modulation. The position of the points in the constellation diagram provides information about distortions in the QAM or QPSK modulator as well as about distortions after the transmission of digitally coded signals.

### **Convolutional Coding**

The data stream to be transmitted via satellite and terrestrial (DVB-S, DVB-T) is loaded bit by bit into shift registers. The data which is split and delayed as it is shifted through different registers is combined in several paths. This means that double the data rate (2 paths) is usually obtained. Puncturing follows to reduce the data rate: the time sequence of the bits is predefined by this coding and is represented by the *trellis diagram*.

### **DIT**

#### **Discontinuity Information Table (PID=0x1E)**

Table ID 0x7E

### **DVB**

#### **Digital Video Broadcasting**

Broadcasting TV signals to a European digital standard

### **DVB-C**

#### **Digital Video Broadcasting - Cable**

Broadcasting TV signals to a European digital standard by cable

### **DVB-S**

#### **Digital Video Broadcasting - Satellite**

Broadcasting TV signals to a European digital standard via satellite

### **DVB-T**

#### **Digital Video Broadcasting - Terrestrial**

Terrestrial broadcasting of TV signals to digital standard

## **EIT**

### **Event Information Table (PID=0x12)**

Containing the TV guide EPG (electronic program guide)  
Table ID 0x4E (actual) - 0x4F (other network, present/following)  
Table ID 0x5.. (actual network schedule)  
Table ID 0x6.. (other network schedule)

## **EPG**

### **Electronic Program Guide**

## **FEC**

### **Forward Error Correction**

Error control bits added to useful data in the *QAM/QPSK* modulator for DVB-C, -S and DVB-T.

## **Guard interval**

Additional safety margin between two transmitted symbols in the *COFDM* standard. The guard interval ensures that echoes occurring in the single-frequency network are eliminated until the received symbol is processed.

## **Interleaver**

The *RS*-protected transport packets are reshuffled byte by byte by the 12-channel interleaver. (RS FEC Reed Solomon FEC) Due to this reshuffle what were neighbouring bytes are now separated by a maximum of 2244 bytes from other TS packets. The purpose of this is the burst error control for defective data blocks

## **Mapping**

Conversion of bytes (8 bits) to  $2n$ -bit wide symbols.

$n$  is thus the bit width for the I and Q quantization; eg at 64 QAM the symbol width is  $2n = 6$  bit,  $n = 3$ , ie I and Q are subdivided into  $2^3 = 8$  amplitude values each

## **MIP**

### **Megaframe Initialization Packet**

Transport stream data packet for synchronisation of all transmitters in a Single Frequency Network (SFN).

## **NIT**

### **Network Information Table (PID=10)**

Information about the network (transmission channels)  
Table IDs 0x40 (actual network) - 0x41 (other network)

## **PAT**

### **Program Association Table (PID=0x00)**

List of all the programs contained in TS Multiplex with reference to PID of PMT  
Table ID 0x00

## **PCR**

### **Program Clock Reference**

## **PES**

### **Packetized Elementary Stream**

## **PID**

### **Packet Identifier**

## **PMT**

### **Program Map Table**

Reference to packets with PCR

Name of programs, copyright, reference of the data streams with PIDs etc. belonging to the relevant program

Table ID 0x02

#### **PSI**

**Program Specific Information**

#### **PT**

**Private Table**

#### **PTC**

**Physical Transmission Channel**

#### **PTS**

**Presentation Time Stamp**

#### **Puncturing**

*Puncturing (DVB-S and -T)* follows to reduce the increased data rate after convolutional coding: The additional redundancy is used for error control. The two data streams after puncturing are applied after resorting the data bits as I and Q input signals to the QAM or QPSK modulator.

#### **QAM**

**Quadrature Amplitude Mode** Type of modulation for digital signals (*DVB-C and -T*). Two signal components I and Q are each quantized and modulated onto two orthogonal carriers as appropriate for the QAM level (4, 16, 32, 64, 128, 256). The *constellation diagram* is obtained by plotting the signal components with I and Q as the coordinate axes. Therefore, 2, 4, 5, 6, 7 or 8 bits of a data stream are transmitted with one symbol, depending on the QAM level (4, 16, 32, 64, 128, 256). This type of modulation is used in cable systems and for coding the COFDM single carriers.

#### **QEF**

**Quasi Error Free**

Less than one uncorrected error per hour at the input of the MPEG2 decoder.  
(BER  $\leq 10^{-11}$ )

#### **QPSK**

**Quadrature Phase Shift Keying**

Type of modulation for digital signals (*DVB-S and -T*). The digital, serial signal components I and Q directly control phase shift keying. The *constellation diagram* with its four discrete states is obtained by representing the signal components using the I and Q signals as coordinate axes. Due to the high nonlinear distortion in the satellite channel, this type of modulation is used for satellite transmission: The 4 discrete states all have the same amplitude that is why non-linear amplitude distortions have no effect.

#### **RS Protection Code**

**RS(204,188,8)**

(RS = Reed Solomon)

16-byte long error control code added to every transport packet consisting of 187 (scrambled) bytes +1 syncbyte with the following result:

The packet has a length of 204 bytes and the decoder can correct up to  $T = 8$  errored bytes. This code ensures a residual Bit Error Ratio BER of approx.  $1 \times 10^{-11}$  at an input error ratio of  $2 \times 10^{-4}$ .

#### **RST**

**Running Status Table (PID=13)**

Accurate and fast adaptation to a new program run if time changes occur in the schedule.

Table ID 0x71

#### **SDT**

**Service Description Table (PID=0x11)**

Description of programs offered.

Table IDs 0x42 (actual network) - 0x46 (other network)

## **SFN**

### **Single Frequency Network**

Transmitter network in which all the transmitters use the same frequency. The coverage areas overlap. Influence of echoes are minimized by *guard intervals*. The transmitters are separated by up to 60 km. The special feature of these networks is efficient frequency utilization

## **SI**

### **Service Information**

Describes all Services and Status of the transmitted TS

## **SIT**

### **Selection Information Table (PID=0x1F)**

Table ID 0x7F

## **ST**

### **Stuffing Table**

Table ID 0x72

## **TDT**

### **Time and Date Table (PID=0x14)**

UTC time and date.

Table ID 0x70

## **TOT**

### **Time Offset Table (PID=0x14)**

UTC time and date with indication of local time offset.

Table ID 0x73

## **Trellis Diagram**

The time sequence of the bits (*DVB-S and -T*) is predefined by convolutional coding and, like the state diagram of a finite statemachine, is represented as a trellis diagram.

## **TS**

### **Transport Stream**

## **UTC**

### **Universal Time Coordinated**

Greenwich meantime.

## **Viterbi Decoding**

Viterbi decoding makes use of the predefined time sequence of the bits through convolutional coding (*DVB-S and -T*). Thanks to a series of logic decisions, the most probably correct way is searched for through the *trellis diagram* and incorrectly transmitted bits are corrected.