



# DVB Subtitling

## Introduction

**DVB** stands for **Digital Video Broadcasting**, and this technology relies on the viewer having a suitable digital receiver either as a standalone Set Top Box (**STB**) or built into their TV set. The transmission method may either be digital terrestrial (DTT), satellite, or cable distribution.

## Scope

The DVB standard supports two styles of subtitling; bitmapped and Teletext. This White Paper concentrates on the more common bitmapped form that is now recommended by the EBU as the preferred form for all new digital services.

Full details of the standards are covered in the ETS 300-743 and ETS 300-472 documents.

## Details

### DVB transmission technology

As its name implies, DVB uses all digital signals throughout the transmission path. Subtitles are generated using a similar technique to open subtitling and then formatted as graphics (bit-maps). This data is then transmitted as part of the station's output transport stream to the set-top box decoders. Once a decoder receives the data the subtitle is then re-constructed in the decoder's memory. A user can select whether to display subtitles or not and, if available, which one of several languages. At the appropriate time the decoder will then display the subtitle on-screen.

There are many technical considerations regarding the use of DVB and the sending of subtitles, including presentation timing and set-top box compatibility; however they are beyond the scope of this paper.



- **Code based (ETS 300 472)**

The DVB code based method is similar in technique to Teletext subtitling where the individual characters that make up a subtitle are represented by single codes which are then transmitted to the receiving equipment. The receiver then looks-up the codes in an on-board table and displays the required characters on-screen. Due to its inherent presentation limitations, code based DVB subtitling has not been generally adopted by broadcasters except where backwards compatibility with older Teletext based receivers was required.

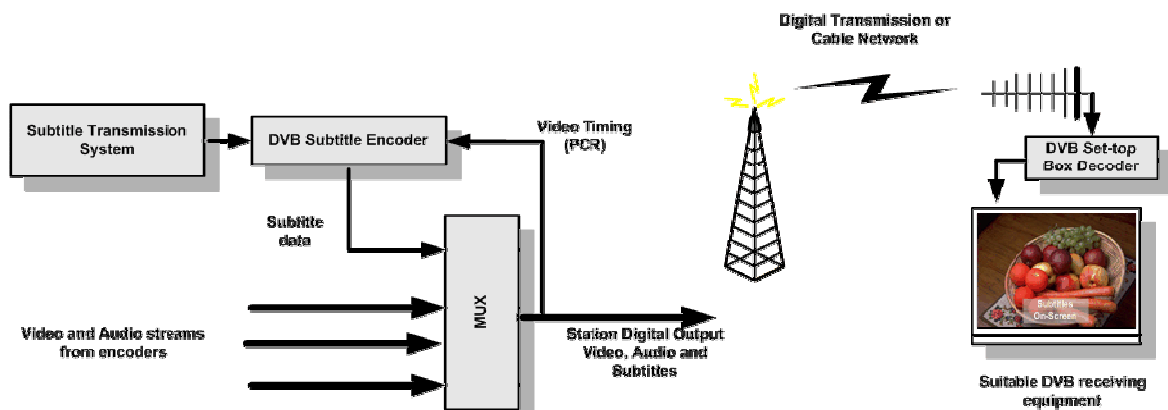
- **Bit-map (ETS 300 743)**

The DVB bit-map method converts the subtitle text into a rendered bit-map graphical object and transmits it as such. This means that subtitle presentation options such as font style, colour, and size can be applied, and are controlled by the broadcaster. However, the viewer can choose whether or not to display the subtitles, and can also choose subtitles from whatever range of languages the broadcaster may provide. The DVB bit-map method has proven popular with broadcasters due to its inherent higher character resolution and the majority of DVB subtitling is now done this way.

### DVB encoding

As the DVB system employs purely digital signals between the broadcast site and the receiver, any subtitles need to be encoded into the DVB digital format prior to transmission. Once encoded the DVB data stream (PES) needs to be multiplexed together with the other program components including video and audio, this is normally done by the main multiplexer (Mux).

When encoding the subtitle data the encoder unit needs to know the current video clock time (PCR) and this is normally read from the output of the Mux.





## Advantages of the DVB system

- DVB technology is now well proven and reliable.
- The viewer can control whether or not the subtitles are displayed.
- High resolution and presentation quality of subtitles - similar to open subtitles.
- The subtitle style, size, and position can be altered by the broadcaster to suit audience requirements and a broadcaster's brand image.
- Special font attributes such as **Outline**, **Box** or **Stripe** with or without transparency can be applied.
- All languages and alphabets can be supported due to the graphical nature of the subtitles.
- Custom and new symbols (e.g. the € symbol) can be added as required as there is no character information stored in the STB.
- Many different languages can be transmitted at the same time from which the viewer can select.
- Makes efficient use of bandwidth.
- Suitable for use on HD services.

## Disadvantages of the DVB system

- Certain older set-top box decoders do not handle subtitle display well.