Chapter 8
Distribution Signals between the Transmitter and Antenna – Event B Model: Distribution TV Signal

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ABSTRACT
What we have solved: the possibility to receive DVB-T (Digital Video Broadcasting Terrestrial) with respect to local conditions for signal. We have deduced: variables that represent a set of so-called useful signal, i.e. the signal suitable for further processing – amplification and distribution. As a case study we have chosen a few examples using Event B Method to show possibility of solving complex projects by this method. The resulting program can be proven to be correct as for its theoretical backgrounds. It is based on Zermelo-Fraenkel set theory with axiom of choice, the concept of generalized substitution and structuring mechanisms (machine, refinement, implementation). B methods are accompanied by mathematical proofs that justify them. Abstract machine in this example connected with mathematical modelling solves an ability to receive DVB-T signal from the plurality of signals, both useful and useless for further processing.

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INTRODUCTION

Multiplexing is apprehended as a combination of visual and audio signals that are spread through a common data channel via a device called multiplexer. The final combined data stream is then called “multiplex” (Handley, 2010).

The source data streams (PES – Packetized Elementary Stream) generated by video recorder or audio recorder are at first lead into a channel multiplex where they are united primarily with other data streams of supplementary data service into the primary multiplexer (VPS, WSS, teletext …) by means of DVB coder (Handley, 2010), (Digital Video Broadcasting, 2009).

In practise, a video recorder, audio recorder and primary multiplexer are formed by the only device called “DVB coder”.

Output data stream (PS – Program Stream) (Handley, 2010) of primary multiplexer or more precisely of DVB coder is after lead into the secondary so called transport multiplex. This unites the streams of particular TV channels with the streams of supplementary service, such as e.g. EPG (electronic programme guide), intenteractive application and such, into a single stream that is called a transport stream (TS – TransportStream) (Kyuheon, 2010).

BACKGROUND

Standard receiving equipment for digital broadcasting means:

1. Revenue on fixed dish, receiver (digital TV, set-top box in conjunction with analog TV or PC) with a minimum of 30 μVdB sensitivity (-77 dBm) connected by coaxial cable to a fixed receiving antenna (Czech Telecommunications Office, 2008).
2. The standard reception equipment for analog or digital television is also considered as a common TV antenna or cable television distribution group home, even if the receiving antenna array located outside the fed group home.

Measuring method:

- Measurement point instead of the measured reception of television signals, which are composed of one or more measuring points.
- Test kit for measuring the intensity of the electromagnetic field kit consisting of antenna, power and measuring device (spectrum analyzer).
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