ABSTRACT

Digital television is the part of digital revolution which has dominated consumer electronics in the 90's. Digital television offers more channels, higher quality and viewer interaction. Multi - media services can be integrated into transmission; viewer becomes user.

This thesis presents the design of three types of digital video broadcasting (DVB) namely terrestrial (DVB-T), satellite (DVB-S), and cable (DVB-C). The functions of the blocks of DVB system (like, RS code, convolutional code and interleaver, puncturing, block interleaver, concatenated code, QAM, QPSK, and OFDM system) are obtained and developed.

Using the communication block set in the Mat lab (6.5) workspace the simulation of the three standards DVB-T, DVB-S, & DVB-C, are achieved. The effect of the input, output signals, spectrum, and bit errors rate BER are studied. It uses interaction model for instruction design model which is a type of the system development model. The effect of many parameters of DVB-T, DVB-S, & DVB-C on their performances are given.

As a result many modified designs for DVB systems are proposed. It is concluded that the inner encoder with a turbo encoder (TC) will result in a powerful Forward Error Correction (FEC). Three types of turbo code techniques are studied, namely, Serial Concatenated Convolutional code (SCCC), Parallel Concatenated Convolutional Code (PCCC), & Hybrid Concatenated Convolutional Code (HCCC). The new proposed designs and their simulations are accomplished and tested .

With this new concatenation code technique of SCCC&PCCC for DVB-T it is shown that the Total Bit Errors rate (BER) is reduced from ($448*10^{-4}$) to ($1124*10^{-4}$) with Bernoulli generator. With Random integer generator the total BER is reduced from ($5006*10^{-4}$) to ($4989*10^{-4}$). With HCCC technique the total BER is reduced from ($4480*10^{-4}$) to ($1342*10^{-4}$) with Bernoulli generator. With Random integer generator the total BER from ($5006*10^{-4}$) to ($4989*10^{-4}$).

On the other hand for DVB-S with the new concatenation code techniques of SCCC & PCCC, it is shown that the total BER errors is reduced from ($1451*10^{-4}$) to ($1124*10^{-4}$) with Bernoulli generator. With Random integer generator the BER is reduced from ($4996*10^{-4}$) to ($4989*10^{-4}$). Finally with HCCC technique the total BER is reduced from ($1451*10^{-4}$) to ($1342*10^{-4}$) with Bernoulli generator. With Random integer generator the total BER is reduced from ($4996*10^{-4}$) to ($4989*10^{-4}$).