

ABSTRACT

In the midst of rapid development of information and communication technology, there are not a few of the people who have not been able to enjoy television services. Most of them are people who live in mountainous areas or in urban areas filled with obstacles such as storey buildings. The problem is the television signals transmitted by television stations are not able to reach the area. However, there is a network that could certainly have reached the area, and it is electrical networks.

And then, how to use electricity network to transmit television signals. Data network which has been developed on the electricity network is the PLC (Power Line Communication). PLC is a data transmission system using electrical cables as the transmission channel. The basic principle of this technology is injecting the information signals into the electrical power lines at a frequency between 500 kHz - 30 MHz. However, the development of PLC systems for the transmission channel is still hampered by poor constraints of PLC channel characteristics is a multipath characteristic, attenuation, and high noise levels which can cause a dropping quality of the transmitted information.

In this Final Project, a transmission system that can serve to transmit television information signals through a channel of PLC has been designed and simulated. The information signals which are transmitted in this simulation are video frames of television broadcasting. Specified target BER is 10^{-5} and the video frames which are used as inputs are divided into 3 types of dark images, middle images, and bright images.

Specification of designed system in this Final Project is using Reed Solomon channel coding, the value of E_b / N_0 is 20 dB, OFDM as multicarrier modulation technique with 128 subcarriers, and the addition of an interleaver block to optimize the system. Reed-Solomon channel coding is used to overcome the burst error problem that is caused by impulse noise, interleaver is used to randomize the burst errors into random errors, and OFDM works to overcome the problem of frequency selective fading which is caused by multipath channel. With this system specification, did not find any errors bit for the case of input are dark images and bright images.

Keywords: *PLC (Power Line Communication), Television, Video Frame Television, OFDM, Interleaver, Channel Coding*