ABSTRACT

DVB-C stands for Digital Video Broadcasting-Cable and it is DVB European consortium standard for the broadcast transmission of digital television over cable. This system transmit an MPEG-2 or MPEG-4 family digital audio/video stream, using a QAM modulation. The advantage of using DVB-C technology that enables the transmission of large ammounts of data with high data rates and safely for the type of transmission error. One of the most important elements is the *modulator* that used to condition and convert the signal to be send and received well over wired networks.

In this final project, *modulator* system is designed and implemented based on FPGA (Field Programmable Gate Array). *Modulator* is designed using 16-QAM modulation as the minimum standard modulation in DVB-C technique. *Modulator* designed was performing using Modelsim Software 6.4a version with VHDL (very High Speed Description Language) as a programming languange. System are designed and implemented on FPGA using a standardized to DVB-C. Primary block on *modulator* will be broken down into 4 series of subsystems based on function. Circuit subsytems consists of Serial to Parallel, Mapper (I channel and Q channel), Signal Generator(ROM Cos and ROM Sin) and a multiplier.

Designed of *modulator* has been Implementation used FPGA Xilinx Virtex-4 XC4VLX25 that have output comprising 32 signals modulated consist of 16 *Inphase* modulated signasl and 16 *Quadrature* modulated signals that using 1% of the FPGA *resource*s usage. In the synthesis process, the design of 16-QAM *modulator* has a maximum frequency of 62.5 KHz.

Key Word : *Modulator* 16-QAM, DVB-C, FPGA, Modelsim