UNIVERSITY COLLEGE SEDAYA INTERNATIONAL
SCHOOL OF ENGINEERING
FINAL YEAR PROJECT
FINAL REPORT

THE DESIGN OF A MODEM USING
BINARY PHASE SHIFT KEYING

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ABSTRACT

The main aim and purpose of this project is to study the operating principle and implement a modulator and demodulator circuit for data transmission of the digital modulation scheme used in communication which is Binary Phase Shift Keying (BPSK). This modulation scheme is widely used in military and commercial communication system. A modulator and demodulator combined together are known as a modem. BPSK modem is a device converting digital signal to analog signal by modulating the signal at the transmitting part and converting the analog signal back to digital signal by demodulating the signal at the receiving part. The transmitting circuit is called the modulator circuit and the receiving circuit is called the demodulator circuit. Modulation is the process of encoding source data onto a carrier signal (usually sinusoidal signal) with frequency fc. Demodulation is the reverse process of modulation and converts the modulated signal back to the original information which was sent. The advantages of employing Binary Phase Shift Keying (BPSK) digital modulation is that, it has good noise immunity, robustness to channel impairments and lower probability of error compared to analog modulation. Simulation is done on the modulator and demodulator circuit of the BPSK modem using MATLAB Version 7.0 and Electronic WorkBench Version 5.12 software's. From the simulation results, it is noticeable how the digital data is modulated onto the carrier wave and the BPSK waveform is obtained at the modulator circuit. The received BPSK waveform is then demodulated and the original digital data is extracted from the carrier wave at the demodulator circuit. To prove that the hardware works fines, two separate computers is needed to show the input at one computer and the output at another computer.

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