

ABSTRACT

Quadrature Phase Shift Keying (QPSK) receiver is used coherent detection system to get information signal which was sent in transmitter. Coherent detection is processing input signal with one carrier signal reference. Those reference signal have synchronous frequency and phase. Carrier recovery is implemented in coherent detection mechanism. Carrier recovery function is restoring carrier signal in receiver. So, those signal have same frequency and phase from its origin in modulator block.

This final project was realized carrier recovery tool in QPSK receiver. There was some carrier recovery methods, one of them was 'Squaring Loop' method. The way of Squaring Loop works is raising QPSK signal to double squarer, so it produces signal with four times carrier signal's frequency component. And information signal's influence will be removed. Then Squaring Loop output signal will be passed in BPF to press its harmonizing frequency. To lock output signal phase, BPF output signal is passed to Phase Lock Loop block. So, PLL output signal has four times frequency component from carrier signal's frequency and stable frequency and phase. Then, PLL output will be passed into divider of four block to get desired carrier signal.

Carrier recovery's system testing cannot be implemented without QPSK modulator as transmitter block. So, this final project is also realizing QPSK modulator with 64 kbps bit rate and 640 kHz carrier frequency.

Realization and measurement process in frequency domain result that QPSK modulator output signal is appropriate with basic theory. QPSK modulator output signal has 1bps/Hz bandwidth efficient, although it is not perfect in time domain. It is caused by the absence of filter block. Carrier recovery system work less in double squarer and BPF. Another carrier recovery section, like PLL, divider of four, and DAC blocks work well if it's tested with function generator's signal output.