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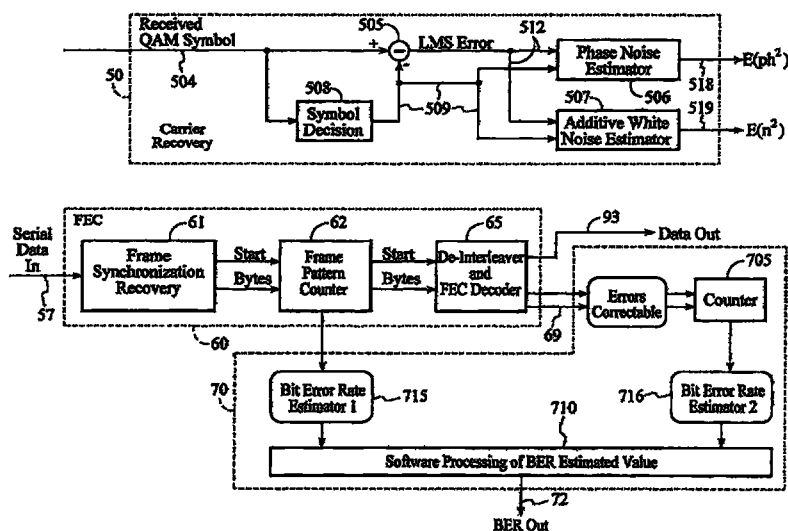
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- (54) Title:** PHASE NOISE AND ADDITIVE NOISE ESTIMATION IN A OAM CARRIER RECOVERY CIRCUIT



(57) Abstract: A QAM demodulator having a carrier recovery circuit (50) that includes a phase estimation circuit (506) and an additive noise estimation circuit (507) which produces an estimation of the residual phase noise (518) and additive noise (519) viewed by the QAM demodulator. The phase noise estimation (518) is based on the least mean square error (512) between the QAM symbol (509) decided by a symbol decision circuit (508) and the received QAM symbol (504). The additive noise estimation is based on the same error as in the phase noise estimation (518), except that it is based only on QAM symbols having the minimum amplitude on the I and Q coordinates. The additive noise estimation (519) is not dependent on the phase of the signal, thus, is independent of the phase noise estimator.