ABSTRACT

TRANSMITTER FOR QAM ENCODED DATA

Quadrature Amplitude Modulated signals are generated from data bits by using a first Quadrature Phase Shift Keying (QPSK) modulator for encoding a first pair of the data bits into one of four carrier signal phases, thereby producing a first QPSK signal. A second QPSK modulator encodes a second pair of the data bits into one of four carrier signal phases, thereby producing a second QPSK signal. The first QPSK signal is amplified to a first power level, and the second QPSK signal is amplified to a second power level. The first and second amplified signals are then combined to produce a signal in which four data bits are encoded. In another aspect of the invention, a new type of modulation, called Offset Quadrature Phase Shift Keying (OQPSK), is used in place of the first and second QPSK modulators, so that an Offset Quadrature Amplitude Modulation (OQAM) transmitter is formed. An OQPSK modulator encodes data bits by encoding a first sub-group of the data bits into a real part of a complex signal at an odd instant of a clock, and by encoding a second sub-group of the data bits into an imaginary part of the complex signal at an even instant of the clock. OQPSK modulation provides the benefit of having all signal transitions being constrained to trajectories around constant radius circles, thereby producing spectral efficiency.

Figure 2