Data communication

Assignment 1

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14-02-04-066 (B1)

Compare and contrast Qpsk and Qam.

Answer

The simplicity of BPSK enticed designer to use 2 bits oat a time in each signal element, thereby decreasing the bond rate and eventually the required bandwidth. The schema is called quadratic PSIC or QPSK because it uses two separate BPSKK modulation, one is in phase the other quadrature is out of phase.

The incoming bits are first placed through a serial to parallel conversion that sends one bit to one modulator & the next bit to the other modulator.

The idea of using two carriers, one in phase and the other quadrature with different amplitude levels for each carrier is the concept behind quadrature amplitude modulation. It is the combination of ASK and PSK.

Constellation diagram for Qam:

1. (b) (c)

What is the logic behind this representation?

Answer

The possible variants of Qam are numerous. Fig(a) shows the simplest 4-Qam scheme (4 different signal element types) using a unipolar NRZ signal to modulate each carrier. This is the same mechanism we used for ASK. Fig(b) shows another 4-Qam using polar NRZ but this is exactly the same as Qpsk. Fig(c) shows another 4-Qam in which we used a signal with two positive levels to module each of the two carriers.