

ABSTRACT

ADAPTIVE DIGITAL SYMBOL RECOVERY FOR AMPLITUDE PHASE
KEYED DIGITAL COMMUNICATION SYSTEMS

Improvements to amplitude phased keyed digital communications systems and to the processing of amplitude phase keyed symbols transmitted over radio frequency channels. A digital symbol recovery circuit (10) in accordance with the present invention, and a quadrature demodulator. The adaptive baseband equalizer receives amplitude phased keyed signals and outputs in-phase and quadrature digital amplitude values corresponding to the received amplitude phased keyed signals. A digital symbol recovery circuit (10) comprises a programmable addressable random access memory (25) that stores a plurality of eight bit words comprising decoded symbol sets of the received amplitude phased keyed signals, and outputs the decoded symbol sets in response to addresses corresponding to the in-phase and quadrature output signals. A quadrature demodulator (12) processes the decoded symbol sets and outputs recovered amplitude phased keyed symbols corresponding to the received amplitude phased keyed signals. Eight bit I and Q amplitude values address 256 x 256 memory locations in the memory of the digital symbol recovery circuit. For example, at each memory location, a seven bit word, for example, is stored. The first four bits define a 4-tuple for the decoded symbol. The fifth bit is a bang-bang phase bit or carrier tracking bit. The sixth bit is a bang-bang automatic gain control bit. The seventh bit is a false lock indicator bit. The invention may be incorporated in an amplitude phased keyed digital communications system (20) including an adaptive baseband equalizer (11).

(FIGURE 1)



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