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GRT GOLDEN RESEARCH THOUGHTS

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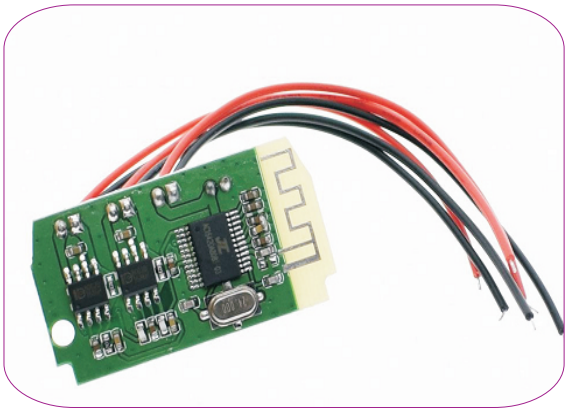
DIGITAL MODULATION TECHNIQUES FOR WIRELESS COMMUNICATIONS SYSTEMS



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ABSTRACT

The wireless communication system has made us able to use radio frequencies to communicate information over long distances. We can send voice or video at rates of more than hundreds of megabits per second, and the associated technology has become so inexpensive that many people are able to afford a mobile phone in order to be in constant contact with others. This paper analyses different modulation techniques used for Software defined radio. SDR technologies are important from the point of future mobile communication system because of its reconfigurable and multimode operational capabilities.

KEYWORDS: *wireless communications, modulation techniques,mobile phone, multimode operational capabilities.*

I. INTRODUCTION

Wireless communication is the transfer of information between two or more points that are not connected by an electrical conductor. For better quality and efficient communication, digital modulation technique is employed. The main advantage of digital modulation over analog modulation includes available bandwidth, high noise immunity and permissible power. The BER value of BPSK We use OFDM because it is suitable for high bandwidth data transmission.to achieve following reason, increase the data throughput, decrease in interference and eliminates bit error rate. Wireless networks consist of a large array of mobile equipment [1-3]. The communication between varieties of mobile equipments is regulated by different IEEE Standards. The SDR provides greatest advantage by its reconfigurable front end capability [4,5In Marconi's case these giants were scientists such as James Clerk Maxwell who proved that radio waves existed, although he could not produce them, and Heinrich Hertz whose name is now used as a unit of frequency, who transmitted the first man-made radio waves. Besides being the first to use the antenna, Marconi did not in fact invent anything new [6,7]. Instead, he was a remarkable engineer who combined the work of many others to produce something that was known theoretically to be feasible. It took him through his adolescence and into his early twenties to develop a wireless system which would even transmit as far as several miles, but after that point the scaling up of radio systems to longer transmission ranges was rapid. By 1897 Marconi and his associates had established a 14.5-mile fixed wireless link over water and the Italian navy had begun to use his invention for ship-to-shore communication [8]. These first communications were digital, using Morse code, which was already widely established for wire line telegraphy. However, the communication rate was slow on the order of 12 words per minute (wpm). The early transmission systems operated at wavelengths of few thousands of meters up to 10,000 meters; this corresponds to 3-30 kHz.

2. MODULATION TECHNIQUES

The digital modulation used in many communication systems has become the basic building blocks of physical interference of all communication technique. Modulation is the process of coding and encoding data or information source for suitable transmission. It involves translating a baseband signal to a pass band signal at high frequency for long transmission. Modulation is done by varying the amplitude, frequency and phase with the aid of the devices such as, phase shift keying (psk) Binary shift keying (bpsk), quadrature phase shift keying (qpsk) and 8-bit psk.

3. PHASE SHIFT KEYING :

Phase shift keying (PSK) is another form of angle modulated, constant amplitude digital modulation.PSK is an M-ARY digital modulation scheme similar to convolutional phase modulation except with PSK the input is a binary digital signal and there are a limited number of output phase possible. The input binary information is encoded into groups of bits before modulation the carrier. The number of output phases is defined by M and determined by the number of bits in the group (n).

4. BINARY SHIFT KEYING :

The simplest form of PSK is binary phase-shift key, where N=1 and M=2.With BPSK, two phase(21=2).In this one phase represent a logic1,and the other phase represent a logic0.BPSK is also called as phase reversal keying(PRK) and biphase modulation.

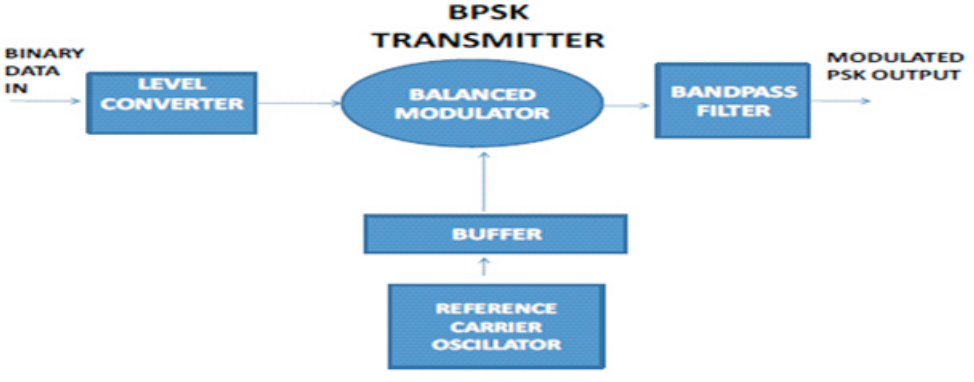

Figure .1BPSK TRANSMITTERS

The Figure 1 shows a block diagram of a BPSK transmitter. Here the balanced modulator acts as a phase receiving switch. And the carrier is transferred to the output in phase or 180° out of phase. Figure 1 represents the transmitter block of BPSK and Table 1 and Figure 2 represents the truth table which gives the output of logic0 and logic1 and phasor diagram.In BPSK modulator, the carrier input signal is multiplied by the data. If +1 v is denoted to a logic1 and -1v is denoted as logic0.And Figure 3 gives the constellation diagram which is also called a signal state-space diagram, which is similar to phasordiagram .

5. SIGNAL TO NOISE RATIO:

SNR is defined as the ratio of power signal and the power of background noise. In digital communication information is transmitted in discrete message bits.The Eb/No allows us to compare different system at bit level. Energy per bit(Eb) can be calculated for discrete time easily since every bit as limited duration.

6. CONCLUSION

This paper presented an analysis of the modem modulation techniques that are used in the latest wireless standards the performance of an OFDM based Communication system adopting digital modulation

techniques. Uses channel under BPSK, QPSK, 8-PSK, 32-PSK modulation techniques. From the result we realize that BER is decreased to a large extent with simultaneous increase in SNR. Hence for the constraint SNR the modulation techniques are selected.

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