

ABSTRACT

Ultra High Frequency (UHF) is one of the frequencies employed in radio communication, with a frequency range spanning from 300 MHz to 3 GHz. It possesses propagation capabilities suitable for radio communication in areas with numerous physical obstacles. UHF communication systems hold the potential as an alternative technology for transmitting text messages through digital communication systems in high-rise buildings or mountainous regions. Software Defined Radio (SDR) technology is among the supportive technologies. This study aims to implement a UHF digital communication system utilizing Quadrature Phase Shift Keying (QPSK) modulation and SDR technology. The applied design is intended for sending and receiving text messages using the USRP platform and LabVIEW. A total of 5 tests for transmitting and receiving text data will be conducted, encompassing variations in both frequency and text data length – specifically, 10, 100, and 1000 characters. These tests will be performed over a distance of ± 48 meters between the TT and REK ITTP buildings. Based on the test results, the average Signal to Noise Ratio (SNR) value decreases as the frequency increases, with no influence from text variations. However, the average Bit Error Rate (BER) increases as the number of text variations sent grows. The average Character Error Rate (CER) demonstrates a linear correlation with BER performance, leading to an increase as the number of text variations sent rises. During the BER and CER tests, frequencies of 1800 and 2100 MHz yield higher values compared to the 900 MHz frequency. Consequently, overall system performance in terms of SNR, BER, and CER parameters will decline with increasing frequency, and the growing number of text variations sent will impact higher BER and CER values.

Keywords: *Software Defined Radio (SDR), Wireless Communication System, Quadrature Phase Shift Keying (QPSK) Modulation.*