

## ABSTRACT

*Audio transmission on indoor channels is strongly affected by multipath fading effects that can hinder and damage signal quality. The technique used to overcome this phenomenon is multicarrier OFDM, this technique works by dividing the signal into a number of mutually orthogonal subcarriers. This research aims to understand how to transmit audio using the multicarrier OFDM technique, as well as knowing the channel characteristics and how much multipath fading affects the quality of the audio received. This simulation utilizes SDR technology to implement the multicarrier OFDM technique to obtain realistic results. SDR RTL2832U and Matlab are used for channel analysis, as well as NI USRP 2920 and GNU Radio for audio transmission. Tests were conducted in NLOS and LOS conditions with variations in the application of BPSK, QPSK, and 16-QAM modulations. The channel analysis results based on the CCDF parameter under NLOS conditions show more severe multipath fading, with a maximum signal value above the average of 0.535 dB, while under LOS conditions it shows a higher value with 1.214 dB. Audio transmission simulation results show that the effect of multipath fading in NLOS conditions has a significant effect on the quality of the received audio. Tests with 16-QAM modulation experienced the most severe impact with an average BER of 0.49522 and SNR of 17.73 dB, where out of five tests, four audio files could not be opened. While for LOS conditions, BPSK with an average BER of 0.00000 and SNR of 17.74 dB, QPSK with an average BER of 0.00000 and SNR of 15.44 dB, then 16-QAM with an average BER of 0.00014 and SNR of 18.72 dB showed excellent audio quality. Overall, this research successfully demonstrates that audio transmission in indoor channels can be done using SDR-based multicarrier OFDM techniques.*

**Keywords:** *Indoor Channel, Multipath Fading, Multicarrier OFDM, Software Defined Radio*