

## ***ABSTRACT***

Multi-Carrier Code Division Multiple Access (MC-CDMA) system is a technique of combining multiple access technique variant with Orthogonal Frequency Division Multiplexing (OFDM). The use of MC-CDMA can combine the advantage from CDMA which anti-jamming (persist in jamming) with OFDM that has efficient bandwidth. Like single carrier CDMA, this technology is so sensitive from interference or Multiple Access Interference (MAI) that exist because of orthogonal thing from each code that is used imperfect or semiorthogonal.

In this Final Project writer reduce effect of MAI using multiuser detection (MUD) technique. This technique can divide signal from each user that is received by receiver. The use of MUD Decorrelator and PIC is expected can reduced the effect of MAI. We evaluate the performance by taking into account Bit Error Rate (BER) versus Signal to Noise Ratio (SNR) and User Mobility.

The result from simulation using Matlab software, the use of MUD decorrelator and PIC make performance better which has 3.3 dB better result than before in  $10^{-3}$  mark of BER. The result of this research conclude before adding MUD, system can reach BER  $10^{-3}$  at SNR 11.7 dB and system with MUD can reach BER  $10^{-3}$  at SNR 8.4 dB. And from this simulation that is done based on change of number of subcarrier, speed of user, and number of user can be obtained result as : the change of three variable effect the performance which the more number of subcarrier the better performance from system, the more speed from user the worst performance from system, and the more number of user the worst performance from system.

**Keywords:** MC-CDMA, DECORRELATOR, PIC, MUD