ABSTRACT

LORAN-C is terrestrial navigation system that operate in frequency band 90—110 KHz to determine location and the velocity of user. LORAN-C system is similar to GPS (Global Positioning System), the difference is LORAN-C uses some transmitter stations and forms chain. In a chain, one station acts as master and the others as secondary. Ideally, LORAN-C signal transmits from transmitter to receiver manner groundwave. But, the fact is receiver receives the signal from skywave too that caused of ionosfer propagation so that it can decrease the accuration of Time of Arrival (TOA) causing the position of user isn't accurate. Based on research before[6], it can be concluded that skywave delay can be detected using ARMA (Autoregressive Moving Average) algorithm. Delay detection using that algorithm results more accurate than FFT (Fast Fourier Transform) algorithm.

This final project designs and simulates other algorithm that can detect skywave delay in LORAN-C system. It is T-MUSIC (Temporal-Multiple Signal Classification) algorithm. Delay estimation based on simulation is compared with delay estimation based on measurement. Besides that, it is measured the large of percents of error happened between simulation result and measuring result.

The result of design shows that T-MUSIC algorithm isn't accurate if it is applied in LORAN-C system. It showed by the big error happened when simulation result is compared with measurement result, especially when uses Butterworth filter that has order 3 and 7. The smallest error is showed when uses Butterworth filter that has order 5.

Keyword : LORAN-C, T-MUSIC, ARMA, *delay*, *skywave*, *groundwave*