ABSTRACT

In principle, radar is developed as a means or tool to help and facilitate human activities. Radio Detection and Ranging (RADAR) is a technology to support, regulate, measure distance, direction, height, and speed between targets by utilizing electromagnetic waves. Radar can also be used for security, when there is a movement of people who look suspicious but are limited by CCTV camera screens, radar technology can make it possible to detect targets from the slightest movement.

There are many types of radars, and one of them is the Stepped Frequency Continuous Wave (SFCW) radar. SFCW radar works by emitting pulse signals in the frequency domain. One of the radar implementations currently being developed in radio communication is Software Defined Radio (SDR). The amount of costs incurred in the development of radar systems makes SDR widespread because it is easily implemented easily. Designing radars by supporting software is expected to reduce costs for hardware design, as well as supporting radars that can be multi-functional and simpler.

In this final project, a simulation will be conducted on the design of the SFCW radar system to support movement using GNU Radio. The distance will be engineered using a block delay. The SFCW radar system for detecting motion will be simulated with a cut-off frequency of 500 MHz and delay variations of the small, medium, and large. The result of the shift that occurs in each delay is 0.1 μs for small delays, 2.5 μs for medium delays, and 10 μs for large delays. It can be seen that the change in delay greatly affects the shift in the target position. The greater the delay given, the farther the target shift will be.

Keywords : SFCW Radar, SDR, Movement, GNU Radio.