

ABSTRACT

Radio Detection and Ranging (Radar) is a device or method that uses electromagnetic waves in radio frequencies to detect the distance, speed, and characteristics of an object. The radar system consists of a transmitter, receiver, antenna, signal processing unit and data processing unit. Based on the signal sent, the radar can be divided into two, namely pulse wave (Radar Pulsa) and continuous wave. One type of continuous-wave radar is the Stepped Frequency Continuous Wave (SFCW) radar. SFCW can produce a wider range and can produce a greater range.

Software that can develop radar technology is Software Defined Radio (SDR). SDR is one example of development in the field of telecommunications technology. SDR can be used for radio circuit design, flexibility in operation, lower costs and easier to design. To implement SDR you can use Universal Software Radio Peripheral (USRP). USRP functions as a hardware replacement that works as a transmitter and receiver on two antennas. Implementation in the design of the SFCW radar system uses USRP which will be operated through the GNU Radio software. GNU Radio functions to provide a signal processing module to implement a radio communication system.

In testing the SFCW radar system using USRP can be done with a frequency of 1 GHz and bandwidth of 10 MHz. The functional results are by what is needed, the FFT signal generated when the delay has changed the peak of the FFT signal changes according to the delay set on GNU Radio. At a delay of 400 ns 1.3 dB, a delay of 500 ns 1.25 dB and a delay of 1.2 dB. The result of a small shift detection to see the phase when moving slowly away from the antenna and approach the antenna. The result of detecting the position of the object when the delay is changed experiences a change, as seen from the FFT signal, the greater the delay, the greater the amplitude value.

Keywords: Radar, SFCW, GNU Radio, USRP.