Radar Systems - Types of Radars

In this chapter, we will discuss in brief the different types of Radar. This chapter provides the information briefly about the types of Radars. Radars can be classified into the following **two types** based on the type of signal with which Radar can be operated.

- Pulse Radar
- Continuous Wave Radar

Now, let us discuss about these two types of Radars one by one.

Pulse Radar

The Radar, which operates with pulse signal is called the **Pulse Radar**. Pulse Radars can be classified into the following two types based on the type of the target it detects.

- Basic Pulse Radar
- Moving Target Indication Radar

Let us now discuss the two Radars briefly.

Basic Pulse Radar

The Radar, which operates with pulse signal for detecting stationary targets, is called the **Basic Pulse Radar** or simply, Pulse Radar. It uses single Antenna for both transmitting and receiving signals with the help of Duplexer.

Antenna will transmit a pulse signal at every clock pulse. The duration between the two clock pulses should be chosen in such a way that the echo signal corresponding to the present clock pulse should be received before the next clock pulse.

Moving Target Indication Radar

The Radar, which operates with pulse signal for detecting non-stationary targe called Moving Target Indication Radar or simply, **MTI Radar**. It uses single An for both transmission and reception of signals with the help of Duplexer.

MTI Radar uses the principle of **Doppler effect** for distinguishing the non-stationary targets from stationary objects.

Continuous Wave Radar

The Radar, which operates with continuous signal or wave is called **Continuous Wave Radar**. They use Doppler Effect for detecting non-stationary targets. Continuous Wave Radars can be classified into the following two types.

- Unmodulated Continuous Wave Radar
- Frequency Modulated Continuous Wave Radar

Now, let us discuss the two Radars briefly.

Unmodulated Continuous Wave Radar

The Radar, which operates with continuous signal (wave) for detecting non-stationary targets is called Unmodulated Continuous Wave Radar or simply, **CW Radar**. It is also called CW Doppler Radar.

This Radar requires two Antennas. Of these two antennas, one Antenna is used for transmitting the signal and the other Antenna is used for receiving the signal. It measures only the speed of the target but not the distance of the target from the Radar.

Frequency Modulated Continuous Wave Radar

If CW Doppler Radar uses the Frequency Modulation, then that Radar is called the Frequency Modulated Continuous Wave **(FMCW)** Radar or FMCW Doppler Radar. It is also called Continuous Wave Frequency Modulated Radar or CWFM Radar.

This Radar requires two Antennas. Among which, one Antenna is used for transmitting the signal and the other Antenna is used for receiving the signal. It measures not only the speed of the target but also the distance of the target from the Radar.

In our subsequent chapters, we will discuss the operations of all these Radars in detail.