

PULSED RADAR SYSTEM

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Abstract

The aim of this project is to study the operation of a Pulsed Radar System and its corresponding signal processing. The project is divided into two part, experimental and software analysis. The experimental part involves in measuring the range or position of the distant target, as well as studying the effect of waveguide and small reflector adjustment. The position of the targets are measured by using three types of display sector scan namely digital scan, analog scan and A-scan. For the software part a fundamentals features of radar signal processing is studied. The three type of filters namely lowpass, highpass and matched filter are analysed. For future works the use of microwave horn antenna as a target in the radar system is suggested.

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1.0 GENERAL INTRODUCTION OF RADAR

1.1 Introduction

By detecting echo signals from its own transmitted signal, a radar system can remotely sense the presence of objects within its field of view. The frequency bands used for radar transmissions may range from a few megahertz as used in High Frequency (HF) radars through the microwave regions to tens of Gigahertz in millimetric radar. Compared with other remote sensing devices using electromagnetic waves, such as the eye, radar is limited in the amount of detail that can be extracted about the scene that is being sensed. It does have advantages; it operates in the dark and when there is haze. Perhaps its most significant property is that it can accurately measure the range between it and distant objects.

Radar, then is a device for extracting information about the scene it surveys. This information could be ;

- i) Presence of objects
- ii) Position of objects
- iii) Properties of Objects (speed, size etc.)

Normally the objects of interest are ships, aircraft and we wish the radar system to tell us only about the particular class of object that was interested in, suppressing all other objects.