VIETNAM AVIATION ACADEMY

Department of Telecommunication - Electronics Engineering Technology

LOCATION IN HO CHI MINH CITY

PROJECT REPORT:

"NDB radar detector module using Arduino"

Written by

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PREAMBLE

In VietNam's aviation industry today as well as in the world, radar is along-range object detection system that uses radio waves to etablish certain parameters of an object like its range, speed and position. Radar technology is used in aircrafts, missiles, marinem, weather predictions and automobiles. Even though the title says "Arduino Radar Project" technically the projects is based on Sonar technology as i will be using an Ultrasonic Sensor to determine the presence of any object in particular range.

Auth. Nguyen Van Anh Tuan

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Chapter 1

Introduction

1.1 PRELIMINARY INTRODUCTION

1.1.1 The reason why to choose project

With the passion for aviation as well as passion for technology and equipment realted to it, i decided to choose an aviation-related project in this project. Fortunately, my project this time is on topic of embedded programming. So, i choose project named "NDB radar detector module using Arduino". In this project, i will rely on the NDB radar to make a small scale NDB radar detector model. So, to get started in this project, we need to know what NDB radar is and how it works.

Recognize the continuous development of aviation technology. I want to add my own knowledge about how a radar system works and a bit of creative idea for this device that came along during i make this project. And that's why i choose this project for myself.

Block diagram

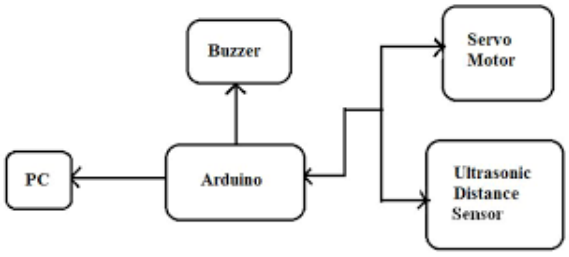

Figure 1.1: Block diagram for radar model

You may ask how the processing application works here. It's very simple, the Ultrasonic sensor collects the object information with the help of Arduino and passes it to processing application, there is a simple Graphics application implemented which mimic a radar screen.

1.1.2 Target Research

The short term goal of this topic is with the desire to learn and supplement the knowledge that in the course of research. With the long term goal, i want to perform the topic in the best way i can. As well as improve the errors of myselft. And also, i want to additional the knowledge i haven't learned at my school.

1.1.3 Object and position research

- **Object Research:** The object that i study is the sensor system installed on the air traffic control station or installed on robots that detect objects and avoid them.
- **Position Research:** My reserach is based on the application of radar to detect missing vehicles or to apply air traffic control as call as "Primary Surveillance Radar".

1.1.4 Method of research

- **Observation Method:** By observing directly at air traffic control and also via movies or aviation videos on internet.
- **Method of analysis:** Looking for some similar projects that have been made available online, from the detailed data of those projects, i draw some methods and experience for my project. Avoid mistakes in my project.

1.1.5 Structure Project

My article is divided into three main sessions, summarized as follow:

- In the first chapter, i will focus on brief introduce my project, presenting some of the research content on the topic of the method of conducting research that gives practical results during the project research process.

- The second chapter, is an introduction about some of basic project implementation theories, to present related project i'm working on it.
- Chapter three is the chapter where i introduce the main content of my project, presenting a basic article of project and how it works, accompany it with some examples.
- The next chapter is the construction and circuit design on Kicad Altium software and the implementation of hardware construction.
- And the final chapter is the final section where i draw some conclusion during project implementation, as well as point out my own strengths weaknesses in the course of my project.

1.2 BASIC THEORY

1.2.1 Some research related to the project