

# CHAPTER I

## INTRODUCTION

### 1.1 Background

Science and technology are developing very rapidly, it creates innovations that develop towards perfect products. In this modern era, technology cannot be separated from everyday life. Technological developments can be included in several aspects. One of them is technology in the electronic field. It cannot be denied that the use of electronic objects is currently a necessity owned by humans. One of them is a synthesizer. The synthesizer is a science that deals with how to design a system that can read and produce artificial sounds. There are three processes carried out on the Synthesizer, namely the reading process, the process of producing sound, and designing a system that can read and emit artificial sounds [1].

Synthesizers can be used to create various types of sounds, including the sound of musical instruments and even sounds that cannot be created by conventional musical instruments. Historically, synthesizers have been an important part of the development of electronic music and have given musicians the ability to produce more complex and innovative sounds and songs. In short, in the 1970s through to the 1980s,

Some new instrument designs use newly introduced techniques, some of which incorporate analog sounds. Some of these digital synthesis technologies were even more cryptic than analog. In an effort to master them, many musicians were forced to ignore analog sounds, so by the mid-1980s, a new generation of musicians emerged who had as much difficulty mastering analog sound synthesis as those who had 2 years earlier [2]. Synthesizers work by generating electronic sound waves that are controlled by a number of parameters or settings, such as frequency, amplitude and waveform. These waves are then converted into sounds that can be heard through loudspeakers or speakers. Synthesizers work by generating electronic sound waves through complex electronic circuits. These sound waves can then be modified, combined, and adjusted to produce the sound desired by the user [3].

There are several types of synths, namely analog synth, digital synth, and software synth. Analog synths use analog circuits to produce sound, while digital synths use digital circuits. Software synth, as the name suggests, is run on a computer device through special software, for example by using a microcontroller called Ar-

## 1.5 Research Method

The research methodology carried out on this thesis are:

1. Study of Literature

Learn basic concept and theories about the Arduino, amplifier and DAC from various references.

2. Design

Designing algorithms and make a flowchart from the analysis that has been done.

3. Writing the Program

After doing the design and flowchart, the next step is applied to writing the program. Writing this program is used IDE language.

4. Implementation

Assembling all components refer to the design including installing the programs.

5. Testing

After completing the program, the next step is testing if the Arduino sending the signal and making the sound we desire.

6. Analysis

Analysis is carried out on data that has been collected and collection of hardware requirements to be made.

## 1.6 Writing Systematic

The systematics of report writing is as follows:

1. CHAPTER 1: INTRODUCTION

This chapter contain Background, Problem Formulation, Purpose, Scope of Problem, Research Methodology, and Writing Schematics.

2. CHAPTER 2: BASIC CONCEPT

This chapter contain basic concepts and theories used in the working process of this thesis that sourced from books, journals, articles, and conferences.

### 3. CHAPTER 3: SYSTEM DESIGN

This chapter contain steps taken in system design and its implementation.

### 4. CHAPTER 4: RESULT AND ANALYSIS

In this chapter, testing process is carried out and the performance results data will be collected by specified parameters then analysed the data.

### 5. CHAPTER 5: CONCLUSION AND SUGGESTION

This chapter contain the conclusion obtained from the result data analysis.