

CHAPTER I

INTRODUCTION

1.1 Background of Final Report

Technological developments in the field of electronics advance rapidly. It is characterized by the discovery of new technologies that are more useful, practical and economical. The existence of these technologies, bring ease-of-hand in carrying out daily activities. One of the technological development is radio. Radio is a communication tool that does not use cable as an intermediary medium, but it uses radio waves to transmit sound. Radio as a medium of communication is cheaper than other communication-information media. Almost every people has radio in their homes, whether in the form of portable radios that can be taken anywhere, the radio incorporated into one with a tape recorder, radio on the phone, or radio that can be heard through the internet. One of the advantages of radio is direct, it means the listener can directly listen to the information broadcast. In addition radio is also fast because it uses the public sphere of frequency as a means of inter-information. Furthermore, radio can be accessed or listened to anywhere and anytime. Therefore, radio can be heard while doing another job.

Radio can be used as a learning medium that is quite effective. Basically radio broadcasts in the teaching-learning program serve to improve audio communication skills, make the learning atmosphere more lively, and increase the

ability of imagination of events or broadcasted events. The advantage of radio is that the learning broadcast program can be recorded. The other advantages are message content can be used repeatedly with consistent, can reach remote areas, and can provide real-world atmosphere with various techniques and sound effects. Radio is suitable for teaching music, history, drama and language, can broadcast special events, actual and historical events.

Radio telecommunication system can use Amplitude Modulation (AM) and Frequency Modulation (FM). Compared to the AM system, the FM system has several advantages, including: more resistant to noise, wider bandwidth, high fidelity and stereo transmission. Frequencies allocated for FM broadcasts are between 88 - 108 MHz, which in this frequency region, it is relatively free from both atmospheric interference and unexpected interference. One important part of a radio station is antenna.

Antenna is a very important component in radio telecommunication system because it serves to transmit or receive radio waves. The antenna acts to receive electrical vibrations from the transmitter and transmit them as radio waves. The antenna has many types from simple to very complex shapes. Each type has its own characteristics and its usefulness. To reach a wider area in a radio broadcast antenna, it is expected to have omnidirectional emission properties.

There are various types of antennas that are omnidirectional. One of them is a vertical antenna. This antenna has a physical size of $\frac{5}{8}$ lambda (). The characteristic of this antenna is not yet widely known for its application for FM radio broadcasting system.

Vertical antenna is an easy-to-make type of antenna with an electrically conductive material of $1/8$, $1/4$, $5/8$, $7/8$ of wavelength. The difference in antenna wavelength it depends on the length of the element of the antenna, and this can be calculated by the formula $(\frac{300}{F(\text{Mhz})} \times \lambda)$. The way of a vertical antenna radiator works depends on the existing ground connections. If the ground is not good, it will cause the current distribution in the radial antenna back to the transmitter and cause considerable power loss and feed point impedance which inhibits antenna radiation. The vertical antenna, with the greatest gain, compared to other vertical antenna types is the $5/8$ vertical antenna which has a gain of 3.3 dBi. The $5/8$ vertical antenna consists of vertical elements of $5/8$ length and horizontal elements of $1/4$ length. Based on these cases, an idea exists to design and implement a $5/8$ vertical antenna, and proceed with fabrication and measurement, in order to be applied to FM radio broadcasting systems. The process of designing a $5/8$ lambda vertical antenna is quite easy. The writer will explain the steps of making a vertical antenna, from designing until calculating the matching frequency.

1.2 Objective of Final Report

The objective of this final report is to apply knowledge about the “Antenna and Propagation” that has been learned during college into a form that can be applied in everyday life.

1.3 Significance of final Report

This final report has two significances. First, this is expected to be a medium for learning about “Antenna and Propagation”. Second, it can be a source of information and reference in the framework of the development of science and technology that is currently growing rapidly.

1.4 Procedure of the Final Report

In writing the final report, the writer does a process of pre-departure training, on-going process, and final report and examination in order to be able finish it, as below:

1.4.1 Pre-departure Training

Before composing the final report, the writer gets the training organized by D-III English Program on May 9th, 2018. The speaker of the training is one of alumni who has studied English in Merdeka University. She shared her experience of selecting well the title of the final report. She also shared how to get a job after graduating from her study.

1.4.2 On-going Process

In this section, the writer does the processes of finding the theory, searching previous literature, and writing the final report during composing the final report.

1.4.2.1 Finding the Theory

It is the most important thing for the writer on composing the final report, as this final report is a non-research based article. The writer search several

theories related to this title, for instance basic concept of antenna and propagation technology. Then, the writer finds the theory in some books and internet, such as article and other references.

1.4.2.2 Searching Previously Literature

Non-research based articles definitely have advantage and inferiority. One of the advantages is that it does not require research, while the inferiority turns weaker if there is no prior research. To strengthen the preparation of the final report, the writer looks for the same observations that already exist. It is permissible if there are some observers who have discussed this topic, but it is in different study field.

1.4.2.3 Writing the Final Report

After all of two points above are fulfilled, finally the writer composes the final report. The D-III English Program gives a guidebook about making formal report. The writer easily types good and right final report.

1.4.3 Final Report and Examination

After finishing the final report, the writer faces a final report examination which determines whether the final report is approved or not. If this is successful, the writer is declared to graduate from D-III English Program.