UNIVERSITI TEKNOLOGI MARA

# THE STUDY ON VIVALDI ANTENNA

Prepared by

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**This thesis is presented to fulfill the requirements for the Bachelor Degree of Electrical Engineering**

## ACKNOWLEDGEMENT

*Bismillahirrahmanirrahim*

Highest praised to god for His gracious to make this entire thing happened. The strength and opportunity that was bestowed upon me is the most essential thing to complete this thesis.

Many thanks also to my project supervisor Puan Norhayati Hamzah for taking me into her custody and giving me advices and guidance to complete this thesis. Your patience in handling students like me would be my aspiration in future accomplishment.

Also, thanks to the entire person that has been involved in the completion of the thesis whether directly or indirectly especially my colleagues and the staff of the lab. It is only God that can pay your kindness and cooperation towards me.

Finally, my thanks will be to my family especially to my mother Puan Hjh Mazenah Hasbullah for all the motivation and support during the process of this thesis completion. Her prayers, kindness and support are the reason of where I stand now. My degree is dedicated for you specially.

*-Al fakir ilallah-*

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## ABSTRACT

THE STUDY ON VIVALDI ANTENNA

Vivaldi antenna is a passive receiver type of antenna that is capable of intercepting thus analyzing any propagated signal in the surrounding. Normally, this antenna operates in the ranges from 2 to 18 GHz, which is within the operational range for military usage. In the beginning, some potential antennas were studied. From the studies, slot Vivaldi antenna was chosen for further research. In order to reduce the cost and time consumption to finish the project, it was decided that only Vivaldi antenna has been taken for further investigation. There were some modification towards the antenna was carried out to improve its performance. At the end of project, a balanced antipodal Vivaldi that operates from 2 to 18 GHz is produced. Also, experiments has been conducted to study the effect of different of the opening width and its length towards its performance and also to find the most optimized characteristic antenna.

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# CHAPTER 1

# 1.0 INTRODUCTION

## 1.1 HISTORY OF COMMUNICATION TECHNOLOGY DEVELOPMENT

Radio communication and propagation (Joseph, 1994) has ease our works and has been an attraction from such a long time. It has successfully connecting people although they are separated in different continent. Radio communication has been developed as early as in 20$^{th}$ century. It is recorded that the earliest experiment has been conducted in 1867. It is in the early of 20$^{th}$ century that human has invented wireless telegraph. This has spark attraction to people when Guglielmo Marconi invented wireless telegraph equipment for commercial usage. With this success, Marconi has brought a new era in radio communication, which happened in December 1903. Marconi and his team have shown the world a system of wireless telegraph that can move across continent, whereas before this wireless technology only limited for short distance only.

Shipment companies are the most beneficial with this wireless technology. This has been proved when two ships in Atlantic Ocean have collided with each other in 1909. All the crew and the passenger are in dire straits in the middle of the icy cold ocean. Then, a radio operator named Jack Binns becomes the first man who sent an emergency code that is "CQD" or "CQE" (not "SOS" which was used nowadays for emergency standards). The code has been sent to nearby ships and they resend the code back to Jack Binns. With this, the nearby ship can locate the collided ship thus saving them from dangers of submerged and coldness.

In 1916, test to sent message in voice form has been successful. This test has been done by the Naval Research Laboratory (NRL) in Arlington, Virginia using amplitude modulation technique. During that time, only waveform with frequency from 20 KHz to 1500 KHz was used for the communication. It was only discovered in 1921 that the waveform can exceed 1500 KHz in communication technology.