



UNIVERSITI TEKNIKAL MALAYSIA MELAKA

BIKER COMMUNICATION DEVICE

This report submitted in accordance with requirement of the Universiti Teknikal
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Technology (Telecommunication) (Hons.)

by

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APPROVAL

This report is submitted to the Faculty of Engineering Technology of UTeM as a partial fulfillment of the requirements for the degree of Bachelor in Electronic Engineering Technology (Telecommunication) (Hons). The member of the supervisory is as follow:

.....
(Abdul Halim Bin Dahalan)

ABSTRAK

Walkie-talkie ialah satu radio mudah alih yang akan berkomunikasi secara tanpa wayar di dalam satu, laluan dan berkongsi jalur frekuensi. Setiap frekuensi yang akan digunakan ialah mesti tidak bertindih dengan frekuensi yang lain kerana hendak mengelak dari kecelaruan frekuensi. *Walkie-talkie* menggunakan pemancar dan litar penerima yang menggunakan tenaga bateri untuk menghidupkannya. Terdapat beberapa komponen yang melengkapkan satu set *walkie-talkie* seperti sebuah mikrofon, pembesar suara dan satu desakan untuk butang bual yang akan membuat pengguna boleh berkomunikasi dan mendengar suara. Tambahan pula, dengan kecanggihan teknologi sekarang ini dapatlah mereka bentuk atau melaksanakan rekaan terbaru yang boleh membuat pengguna boleh menggunakan ia di atas jalan raya dengan mudah. Misalnya, pengguna yang selalu menghabiskan masa di hujung minggu dengan aktiviti-aktiviti konvoi. Rekaan terbaru akan membangunkan. Peranti ini untuk penunggang bagi pastikan ia akan menjadi mudah digunakan semasa mempunyai perjalanan mereka dan ia juga boleh mengelak penunggang dari berlakunya kemalangan kerana tidak menumpukan sepenuh perhatian semasa aktiviti konvoi. Peranti ini akan dinamakan sebagai *Biker Communication Device*. Peranti ini akan dipasang di tepi keledar dan ia juga hanya menggunakan satu saluran kerana hendak mengelak lebih frekuensi. Peranti juga boleh membuat penunggang mudah menggunakannya kerana ia hanya tekan tolakan untuk butang bual dan bercakap dan pengguna lain akan menerima suara dan peranti tidak perlu dipegang dengan tangan dan ia akan memastikan penunggang memberi sepenuh perhatian semasa melakukan aktiviti konvoi dan daripada itu ia dapat mengelakkan kemalangan semasa aktiviti konvoi.

ABSTRACT

The walkie-talkie is a portable radio that will communicate wirelessly on a single, shared frequency band. Every frequency that will be use is must do not overlap with the other frequency because want to avoid from the distortion. The walkie-talkie is using the transmitter and the receiver circuit that powered up by the battery. There are the component that will complete one set of walkie-talkie such as a microphone, speaker and a push to talk button that will make the user can communicate and hear the voice. Furthermore, with the advance of the technology nowadays there are respected to design or implement the new device that can make the user can use it in a easy way. For example, the user that always spent time on weekend with the convoy activities. So that, the new device will be develop. This device is for the rider to make sure it will be easy to use while having their journey and it also can avoid the rider cause an accident because do not concentrate when having the convoy activities. This device will be name as Biker Communication Device. This device will be installed at the helmet and it also just using one channel because wants to avoid the redundancy of the frequency. The device also can make the rider easy to use because it just press the push to talk button and speak and the another user will receive the voice and the device do not hold with the hands and it will make the rider give full attention when having their activities and from that the causes of the accident cause by the convoy activities will be reduce.

DEDICATION

Alhamdulillah, praise to the Almighty Allah S.W.T

This thesis is dedicated to:

My beloved family,

My Parents,

My Supervisor,

My lecturers

And all my friends

Thanks for their encouragement and support

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Alhamdulillah, thank you Allah because of Your Blessing and give me strength to complete and finish my final year project with successfully.

During the process to complete my project objective, I do a lot of research either by using internet, reading past year thesis, reference books and journal. With the guidance and support from peoples around me, I finally complete the project due to the time given. Here, I want to give credit to those who helped me to achieve what I had achieved in my final year project.

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LIST OF ABBREVIATIONS, SYMBOLS AND NOMENCLATURE

SOS	-	Save Our Seamen
ID	-	Identification
Wi-Fi	-	Wireless Networking
IP	-	Internet Protocol
GPS	-	Global Positioning System
V2V	-	Vehicle-to-Vehicle
V2I	-	Vehicle-to-Infrastructure
I2V	-	Infrastructure-to-Vehicle
CO ₂	-	Carbon Dioxide
DWT	-	Digital Walkie-Talkie
ASIC	-	Australian Securities and Investments Commission
DTMF	-	Dual Tone Multi Frequency
FRS	-	Family Radio Service
GMRS	-	General Mobile Radio Service
PA	-	Power Amplifier
RF	-	Radio Frequency
RFC	-	Request for Comment
MHz	-	Mega Hertz
V	-	Volt
DC	-	Direct Current
K Ω	-	Kilo Ohm
PCB	-	Printed Circuit Board
C	-	Capacitor
L	-	Inductor
R	-	Resistor
μ F	-	Micro Farad

CHAPTER 1

INTRODUCTION

The first chapter includes the briefing of the idea to develop this project. It will focused on the project overview and the problem statement and the objective why making this project.

1.1 Introduction

Nowadays, there are many type and brand of walkie-talkie that was produce by many companies such as Cobra, Garmin, Midland, Motorola and Uniden. Each of the walkie-talkies has their own characteristic and criteria. The channel that use by all this walkie-talkie also different depends on the purpose what there are manufactured for? Besides that, there many types of walkie-talkies in the market nowadays, but it are responsibility to develop a new walkie-talkie which can be efficiently used by the rider during their convoy activities. The basic idea for this project is want to apply this device at the helmet and can make the rider easy to use and can be more concentrate while they are riding.

1.2 Background Project

Bikers Communication Device that will be used for motorcycle's user during their convoy activities. This device will make the user communicate easily to each other because we will install this devices at the helmet and can make it easy to use. After that, this device will set for the specific frequency because we don't want to channel it while we are on the road. The frequency for this device that will be use is for 40.6MHz. This device has two sections which is one for transmitter and the other section for receiver. This circuit also known as transceiver circuit that contain both transmitter and the receiver. The normal walkie-talkie need the user to channel the frequency to communicate while we doing this project we just set for one frequency to avoid from noise and overlap with other frequency. This device will make the convoy activities become more safety because we just need to push at one button to communicate with each other and no need to find the channel. After that, by using this device the motorcycle's user can be more concentrate on the road during convoy activities.

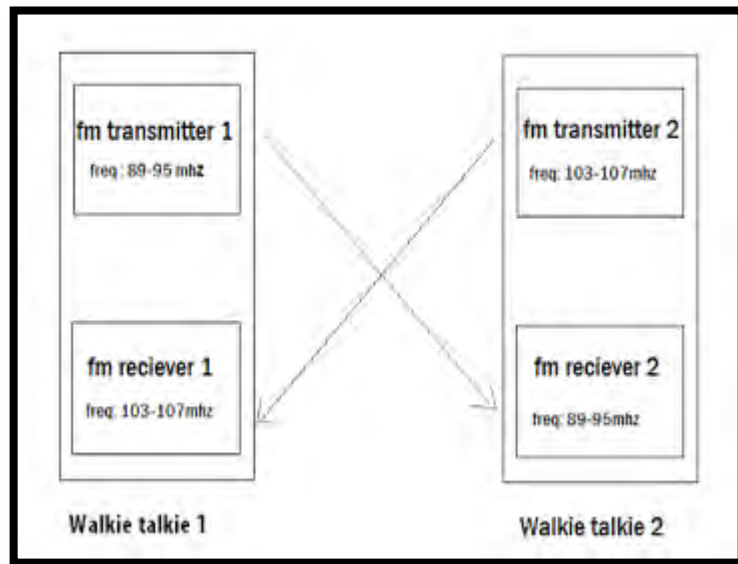


Figure 1.1: Pair of Transmitter and Receiver

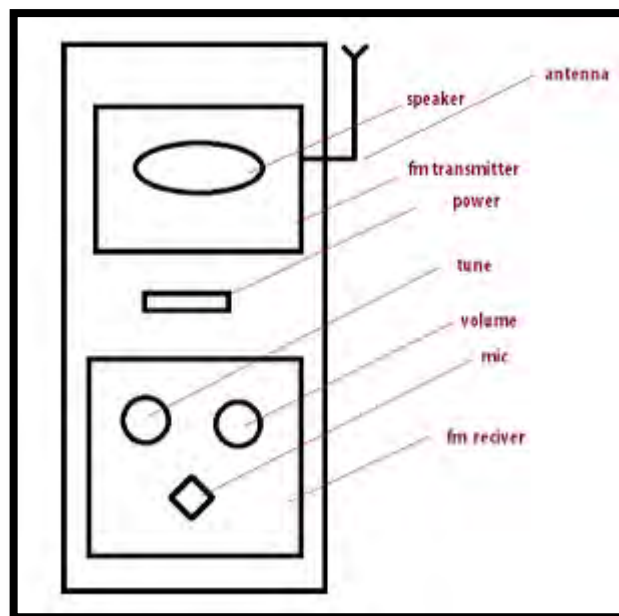


Figure 1.2: The Display of Walkie-Talkie

1.3 Problem Statement

The convoy activities nowadays have high risk while they are on the road. While they doing convoy activities there are someone motorcycle will break down and will make they split and become far distance and it will make the rider lost and they also can be more risk while using walkie-talkie during their journey and make them not concentrate on their riding. This will increase of the accident while convoy activities.



Figure 1.3: Originally Walkie-Talkie



Figure 1.4: After Upgrade

1.4 Objective

In this project, an improvement for the Bikers Communication Device will be implementing. The objective is very important because the achievement of the objective in completing this report. In order to make this project were successfully it must follow the objective that has been targeted. The core objective which has been designated as fundamental to the project is:

- a) To study how far that range can be used between receiver and transmitter
- b) To develop the Bikers Communication Device that can be install at the helmet and easy to use.
- c) To implement the new device that can avoid many accidents during motorcycle convoy activities.

1.5 Work Scope

The main scope of this project is to communicate between the riders during motorcycle convoy activities by using the device same as walkie-talkie that was install at the helmet. This biker communication device will be used as a prototype and it will set to operates for a few actions such transmit and receive the command between two people. This device will set for only one channel to make sure it easy to use and can avoid from overlapping the frequency during communicate. Another scope is this device will make the riders easy to use and no need to hold the walkie-talkie because it will make the rider not concentrate while there are riding. These project use transceiver circuits which mean it contains both circuits which are transmitter and receiver. The distance of the signal depends on the power that supplied on it and the signal strength (dBm) and also the power for the circuit.

1.6 Project Significant

This biker communication device is using the transmitter and the receiver circuit but it already being upgrade to make sure it give the benefit to the rider and can reduce the accident while convoy activities. By using this device, the rider does not need to hold first and need to press the button when want start to talk. By using this biker communication device the rider or the user just install at the helmet and feel free when it no needs to hold this device. So that, both hand of the rider can grip fully at the handle just need push the button when want start to talk.

1.7 Report Organization

In this part, it will explain the process and the flow for completing this report and project. This report will be having a few chapters and it will be explain each of the part as below:

Chapter 1: Introduction

In this chapter it will simply briefing what is the project to be. For this part, it contains introduction, problem statement, objective, work scope, project significant and what have included in this report.

Chapter 2: Literature Review

This chapter explains about the research of our project and also it is the previous project that can make as references.

Chapter 3: Methodology

In this part, it will show the method that we use for making this project. The entire step from the beginning to produce this device will include in this part.

Chapter 4: Result Expectation

For this part, it will state what the project look like and what the result will be obtain when the project already done, is it the product can achieve the target.

Chapter 5: Conclusion

Lastly, this chapter will summarize the entire project that already done and also the major conclusion of this project to discuss that is it the project achieve the entire objective.

CHAPTER 2

LITERATURE REVIEW

While making this project, there are some studied and research had been done to complete this report. The information was gained by many sources such as books, articles, journals, and internet. All the information that been collected is very useful as a guide in doing this project. The collecting data is based on the past related study.

2.1 Introduction

In this chapter will describe the literature review, which related to the Biker Communication Device that will be uses during convoy activity by using receiver and the transmitter. The literature review is important which because we can learn new thing before the previous project and we also can implement the new project base on old project that will make it suitable and more easy to use. The reference from previous project will make we get more knowledge about what we want to do. Nowadays, many type of walkie-talkie at the market, as we know the many brands that produce the walkie-talkie but how many brand that provide the simple walkie-talkie that easy to use with two channel which is one for transmit and one for receive. There also, we can learn the movement of the frequency from it transmit and when it receives. Currently, most walkie-talkie use receiver and the transmitter as the medium sent data and the different is between the range that can walkie-talkie support and the channel that provide in walkie-talkie. Unfortunately, walkie-talkie is less secure due to its limitation range and the way to use it. Thus, by implement and develop Biker Communication Device it will overcome this entire problem.

2.2 Application of Walkie-Talkie

There are many walkie-talkies nowadays at the market and there also has much different function compare to each other. By this project, we will use more simple way to develop and implement new walkie-talkie to make it safe to use and easy to handle. This project will name it as Biker Communication Device that only uses one channel of transmission frequency to transmit and receive the data.

The development of this device will make user friendly with it and more safety while use it. This device also use the receiver and transmitter but we change the using of frequency by using one channel only and the device will install direct to the helmet. There is some research from the previous project that are using walkie-talkie and implement from it.

2.3 Walkie-Talkie Application upon Android Device

How to handle this Save Our Seamen (SOS) communication in these emergent circumstances are very critical. The solution to address all these needs is wireless direct communication of Walkie-Talkie in this report. This direct communication of Walkie-Talkie allows two or more peers to talk to other ones directly by using mobile devices. In order to meet all those needs requiring Walkie-Talkie we designed and specified some goals or principles to design the wireless direct communication framework. First of all, this direct mobile communication does not rely on access point. Second of all, this direct mobile communication is wireless. Third of all, this direct mobile communication is low latency, meaning that the talk is responded very quickly. Fourth of all, this direct mobile communication is high bandwidth, meaning that there is no congestion and audio is very smooth. We summarized these design goals or principles to be ad-hoc, wireless and real-time. To implement these design principles we choose to implement our walkie-talkie in android mobile devices on top of Wi-Fi-Direct. (Professor Bhaskar Krishnamachari, 2012)