INTELLIGENT SAFETY HELMET FOR MOTORCYCLIST

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This report is submitted in partial fulfillment of the requirements for the award of
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DEDICATION

Special for.....

Beloved parents and families,
Supervisor, Mr. Ahmad Nizam Bin Mohd Jahari@Johari who a lot to give encouragement and guidance,
Friends and those involved directly or indirectly.

Thank You for Your Sacrifice and Good Service.

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From the results of this project implementation, a lot of things can I get and learn in terms of time management, cost management and project management that are efficient and effective. Various studies have been done to ensure that my project work properly and achieve its objectives. I hope that my project can make as pilot to other students so that more knowledge is generated to create new ideas, more innovative and suitable with global developments and current technology.

Thank you.

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ABSTRACT

Intelligent Safety Helmet for Motorcyclist is a project undertaken to increase the rate of road safety among motorcyclists. The idea is obtained after knowing that the increasing number of fatal road accidents over the years is cause for concern among motorcyclists. Through the study identified, it is caused the helmets used is not in safety features such as not wearing a helmet string and not use the appropriate size. Therefore, this project is designed to introduce security systems for the motorcyclist to wear the helmet properly. With the use of RF transmitter and RF receiver circuit, the motorcycle can move if there is emission signal from the helmet, in accordance with the project title Intelligent Safety Helmet for Motorcyclist. Security system applied in this project meet the characteristics of a perfect rider and the application should be highlighted. The project is expected to improve safety and reduce accidents, especially fatal to the motorcyclist.

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ABSTRAK

Intelligent Safety Helmet for Motorcyclist merupakan satu projek yang dilaksanakan untuk meningkatkan kadar keselamatan jalanraya di kalangan penunggang motosikal. Idea tersebut diperolehi setelah mengetahui bahawa peningkatan jumlah kemalangan maut di jalanraya dari tahun ke tahun adalah membimbangkan di kalangan penunggang motosikal. Menurut kajian yang dikenal pasti, ia adalah disebabkan oleh pemakaian topi keledar yang tidak menepati ciri-ciri keselamatan yang sepatutnya seperti tidak memasang tali topi keledar dan memakai dengan saiz yang tidak sesuai. Oleh yang demikian, projek ini direka bagi memperkenalkan sistem keselamatan kepada penunggang dengan pemakaian topi keledar yang sempurna. Dengan penggunaan litar Penghantar RF dan Penerima RF, motosikal boleh bergerak sekiranya terdapat pancaran isyarat daripada topi keledar. Sistem keselamatan yang diterapkan di dalam projek ini adalah menepati ciri-ciri penunggang sempurna dan semestinya penggunaannya perlu diketengahkan. Projek ini diharapkan dapat meningkatkan tahap keselamatan dan mengurangkan kemalangan maut khususnya kepada penunggang motosikal.

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LIST OF ABBREVIATION

GPS	-	Global Positioning System
IrDA	-	Infrared Data Association
OEM	-	Original Equipment Manufacturers
PDIP	-	Plastic Dual In-Line Package
PWM	-	Pulse Width Modulation
RA-LED	-	Right Angle LED (Light Emitting Diode)
SOIC	-	Small Outline Integrated Circuit
SSOP	-	Small Shrink Outline Package
UART	-	Universal Asynchronous Receiver/Transmitter

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CHAPTER I

INTRODUCTION

Intelligent Safety Helmet for Motorcyclist is to highlight the system secure riding among motorcyclists in Malaysia. It introduced a security system on the rider with the perfect helmet usage before riding. By using RF transmitter and RF receiver, the motorcycle can be moved if it receive signal from the helmet.

1.7 Background of Study

Information taken from the sfhassan@hmetro.com reviewed by Siti Fatimah Hassan, entitled "Many Ignore Helmet" states that the attitude of the rider and the pillion rider who 'wiry' wearing helmets accounted for about half the rate of road deaths [1].

Through the same source, the statistics show the number of accidents in the city from 2003 to 2004 increased by 2 165 cases [1]. Survey results found that the number of motorcycle accidents is still high even though the case is said to decline in 2004.

General Director of Dewan Bandaraya Kuala Lumpur (DBKL), Salleh Yusop, said many riders are still failing to give emphasis to the use of helmets when on the road [2]. It can be seen on censuses of the Kuala Lumpur Police Traffic issued

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a 2666 suit to the error. "There are many who are not seriously looking at the use of helmets that bear the number of suits increased from year to year," he said when launching the Road Safety Campaign Encouraging Consumers Helmet Initiative and Defensive Driving and pillion rider in Cheras, Kuala Lumpur [1]. The campaign was organized collaboration between City Hall, Federal Territory Road Safety Council, Kuala Lumpur, Police Traffic, Department of Information and Education Department.

According to the Road Safety Research Unit of Universiti Putra Malaysia in his speech the Minister of Transport, of the 6282 road accident fatalities recorded in 2003, 60% of them involving motorcyclists and pillion riders. In addition, 68% of fatal accidents involving them occurred in rural areas where 57.6% were due to head injury [2]. Recognizing the increasing number and cause of death, the government took the initiative to launch this campaign is designed to give primary emphasis to motorcyclists in the rural areas to create awareness to wear a helmet properly aligned with the campaign theme of 'Use Helmet Correctly Saves Lives'.

Sources of the Sarawak Tribune, dated August 22, 2004 also had to comment on an awareness campaign to encourage use of helmets by motorcyclists in the rural areas that have been launched by the Mayor of Kapit District Council. The campaign, themed "The use of Helmet Head Injury Prevention", has organized by the Committee on Road Safety, Kapit Division [3].

Thus, it is clear from the sources mentioned that the use of a helmet is very important to enhance the safety of motorcyclists on the road. Thus, the creation of the project Intelligent Safety Helmet for Motorcyclist campaign is expected to be undertaken to achieve the targeted goals in line with posters designed to raise public awareness of the importance of Malaysia's road safety, especially motorcyclists.

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1.2 Problem Statement

As we all know that every brand in the market for vehicles, especially motorcycles have a function, advantages and sophistication of its own. Although progress is increasing, the safety of motorcyclists on the road is still not guaranteed. One cause of the accident or death among motorcyclists were not wearing helmets used by the correct procedures, for example, do not fasten the safety strap on the helmet and the helmet does not use the appropriate size. Because the accident rate for motorcyclists is increasing from year to year, an Intelligent Safety Helmet for Motorcyclist developed which inspired its security features for motorcycle riders.

1.3 Objective

The objectives of this project are:

i. To study and understand the concept of RF Transmitter and RF Receiver circuit in implementing the project.
ii. To design the circuit that can improve the safety of motorcyclists.
iii. To develop an intelligent safety helmet for complete rider.

1.4 Scope

The scope of this project is a motorcycle rider that they care about their safety while riding. As we know, the motorcycle riders are now less concerned about their safety while riding, then the creation of this helmet safety rates can be increased and the rate of road accidents can be reduce.

Based on the RF transmitter circuit used in this project, this circuit is mounted on the helmet as a signal transmitter to a motorcycle in which they showed that the helmet had been worn properly. Information signals system in this helmet is based on the three switches mounted on the top and sides of the helmet (inside) and the helmet strap fastener. All the three switches should be active to activate the

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transmitter signal to a receiver signal at the motorcycle. To determine whether the three switches are active or not, the LED is used as an active signal switch.

While the RF receiver circuit mounted on the motorcycle as a motor control switch which is activated when receive a signal from the transmitter. Then, the occurrence of contact on the motor switch that causes to operate motorcycle (moving). This system prevents the rider from riding without wearing proper helmet.

1.5 Expected Results

As has been stated from various sources such as print media or electronic media, wearing a helmet is very important to improve the safety of motorcyclists on the road. Thus, the development of this project, expected safety campaigns undertaken to achieve the targeted goals in line with posters made to increase public awareness of the importance of road safety Malaysia especially for motorcyclists. It is evidenced by the expected outcomes of this project, in which a helmet strap installed, the contact will occur at the receiving circuit. Conditions in causing the recipient and Light Control circuit will be active. The next occurrence of contact on the receiver circuit can cause the motorcycle operation. Then, this project hoped will prevent riders from riding without wearing a proper helmet.

1.6 Thesis Outline

This thesis consists of six chapters namely introduction, literature review, methodology, results and project analysis, discussion, conclusion and recommendation. Chapter I is introduction to tell the rough description of the project implemented. It includes a project overview, background of project, problem statement, objectives, scope and expected results. From the literature review in Chapter II, many guide and knowledge gained to inspire new ideas in the implementation of the project. The selection of the circuit related to the project also can be identified. Next, the process of implementing the project will run smoothly with the properly method and systematic. It is described in Chapter III in this thesis.

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Methodology chapter is to facilitate the implementation of the project until the end. The methods used also helps to get expected results for this project. Each result will be recorded in Chapter IV that result and analysis. Observation and understanding is essential to analyze the results. With theoretical and technical knowledge, the hypothesis can be realized. Then, Chapter V is the discussion of the results and problems encountered in project implementation and completion. Each discussion is based on theoretical and technical projects undertaken. This thesis ends with conclusions in Chapter VI. The conclusion of thesis represents the formulation of the study. It cover the project findings, analysis of project performance, further research for the future, next the discussion of knowledge and contributions to the university, faculty or oneself.

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CHAPTER II

LITERATURE REVIEW

This chapter described a review of previous studies that is related with this case study will be discussed. The literature review is conducting to understand the concept and also to get some ideas about the wireless system. Besides that, this research give description related the concepts, functionality, project procedure, components, equipment and also the cost of the project.

2.1 Motorcycle Safety Helmet

The Motorcycle Safety Helmet that design by Chandra D. Allen on December 6, 1996 was developed to ensure the welfare and safety of motorcyclists. There are three design areas addressed in this product: sensors, signal processing, antennas, and transceivers [4]. The helmet comes with a complementary hall effect sensor, which attaches to the motorcycle frame near the front wheel. Two magnets, with opposing polarities, are placed directly onto two spokes of the wheel. The voltage is then transmitted to the helmet where a speed comparison is done. If the cyclist is speeding, a pre-recorded audio message, warning the driver to slow down, plays. In a case of an accident, the helmet uses the ADXL150AQ accelerometer to detect impact. Upon an impact that exceeds the threshold, a 911 distress call is made to the local police station. Incorporating technology that is used in cellular phones, the police station will receive latitude and longitudinal information allowing them to

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