WIRELESS COMMUNICATION APARATUS SYSTEM FOR MEDICAL BED

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This report is submitted in partial fulfillment of requirements for the award of Bachelor of Electronic Engineering (Industrial Electronics) with Honours

Faculty of Electronics and Computer Engineering Universiti Teknikal Malaysia Melaka

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BORANG PENGESAHAN STATUS LAPORAN

PROJEK SARJANA MUDA II

Tajuk Projek : WIRELESS COMMUNICATION APARATUS SYSTEM FOR MEDICAL BED

Sesi Pengajian :

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Signature : ……..

Supervisor Name : ROSMAN BIN ABD. RAHIM

Date : 3rd of MAY 2011

DEDICATION

Dedicated, in thankful appreciation for support, encouragement and understandings to my beloved mother and father, brother and sister, and as well as my supportive friends.

ACKNOWLEDGEMENT

Alhamdulillah….

First and foremost, I would like to take this opportunity to express my grateful to ALLAH because give me a good health and destiny to me finish this project. Praise to Allah S.WT The Most Gracious, The Most Merciful, there is no power no strength save in Allah, The Highest and The Greatest, whose blessing and guidance have helped me through the process of completing this project. Peace and blessing of Allah be upon our prophet Muhammad S.A.W who has given light to mankind

Secondly, I would like to express my warmest gratitude to my supportive supervisors, En. Rosman Bin Abd Rahim and En. Mohd Riduan Bin Ahmad who have provided immeasurable support and guidance toward the completion of my research project. They remarkable ideas and suggestions will be much appreciated in the long run of my career.

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I also would like to thank all my friends who had given me helps technically and mentally throughout my journey in completing my project. I thank you from the bottom of my heart. I wish you all the best in life and hope that our friendship will last forever.

ABSTRACT

The project is specially intended to reduce energy human consumption especially for medical staff in hospitals to simplify their busy work day. Thus, a tool designed to help medical staff is “Wireless Communication Apparatus System for Medical Bed” which can provide a user friendly environment where customers can use this facility in wireless control. Focus or main purpose is to bring or move patients from one place to another place without using man power. This idea was arising from my perception when going industrial training at the hospital. These moves are controlled by human or computer and data transmission medium is wireless router. Using toy car remote control concept, it has radio frequency transmitter and receiver. This depends on the frequency of the transmitter and receiver to be used. Transmitter and receiver is already in the market whether if want to use a complex, medium or low specifications depending on usage.

ABSTRAK

Projek ini dicadangkan khusus untuk mengurangkan penggunaan tenaga manusia terutama untuk kakitangan perubatan di hospital untuk mempermudahkan kerja seharian mereka yang sibuk. Oleh demikian, satu alat dicipta untuk membantu kakitangan perubatan iaitu "Wireless Communication Apparatus System for Medical Bed" yang dapat menyediakan persekitaran yang mesra pengguna dimana pelanggan boleh menggunakan kemudahan ini dengan menggunakan kawalan tanpa wayar. Fokus atau tujuan utama adalah untuk membawa atau memindahkan pesakit dari satu tempat ke tempat yang lain tanpa menggunakan tenaga manusia. Idea ini timbul daripada pengalaman saya ketika saya menjalani latihan industri di hospital. Sistem katil ini tidak banyak diterapkan di hospital. Katil ini bergerak secara automatik dengan dikawal pada komputer. Inovasi ini berkaitan dengan sistem kereta mainan menggunakan alat kawalan jauh dikawal oleh manusia atau komputer dan pengantaraan penghantaran data adalah penghala tanpa wayar. Kawalan menggunakan alat kawalan jauh kereta mainan mempunyai pemancar dan penerima. Litar ini bergantung kepada frekuensi yang hendak digunakan. Pemancar dan penerima ini sudah ada dipasaran samada ingin menggunakan yang kompleks, sederhana atau murah bergantung kepada keperluan penggunanya.

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CHAPTER 1

INTRODUCTION

This chapter will discuss about the project direction and aims in details. All related issues such as the problem statement, scope of work, and the project significant will be highlighted.

1.1 Project Objectives

The objectives of the project are:-

i. To design a medical bed system that can be moved wirelessly and ease to medical staff.
ii. To facilitate users to move bed by using wireless network control.

1.2 Problems Statement

Every electronic bed that is being used in hospital moved from one place to another place manually by using the human energy. The main idea is to move the bed by using network control. There are some problems in order to keep this project going:-

i. To expand the project with volubility in order to produce positive affect and also interesting changes.
ii. To combine RF circuit with PIC circuit and to make the connection between router and PIC wirelessly.

1.3 Scopes of Work.

This project is known as "Communication Apparatus System for Medical Bed", as it automatically functions using the wireless network control system to operate without using human energy in order to complete a task. To continue the development, there are some research have been done. There are three main parts to complete this development/design:-

i. System design to generate wireless connection
   - Component or part will be involed are Computer (Server), WIFI usb adapter, and wireless router.

ii. System design using RF
   - Component which involved on this part is transmitter and another for recipient part is receiver. The acceptor circuit (receiver) must be connected to switch to control four functions, left, right, forward and backward. For the transmitter circuit must be connected with the relay control output circuit and receiver and transmitter use the 9v of Dc voltage supply.

iii. Controller Circuit using PIC
   - Design and development of the system controller using PIC

Transmitter circuit is used to transmit the signal to receiver circuit at 315MHz frequency (optional). The relay circuit is designed to simplify the control process which is to avoid damage at the control circuit. The control circuit PIC is connected to the RF circuit which is connected to drive the motor.

1.4 Project Significant.

For the project, can be able to use this equipment especially in the hospital sector; consumer can use this equipment to bring and move patient from one place to another place wirelessly.

1.5 Thesis Outline.

This thesis is divided into five chapters. In chapter 1, an introduction of project is presented along with the project objective, scope of this project and the expected outcome for this project. Chapter 2 is begin with the literature review the previous project or thesis that related with this project. Then in this chapter also provides a review on the research of the components and software that have been used in this project. Chapter 3 discusses the methodology and approach that used to develop this project, and chapter 4 discusses the result and discussion. The last chapter summarizes this project, discusses of this project and suggests possible future works.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

Literature review was carried out throughout the whole project to gain knowledge and skills needed to complete this project. The main sources for this project are the previous project and thesis that is related to this project. And the other sources are books, journals and articles obtained from Internet. So this chapter discusses the projects and theses related to this project.

Therefore, by analysis the project did by other researchers, there is a possibility to know what features are lacking in their projects. It is very important to improve and to develop a successful project. This project also will recommend some future works that could be done to improve the same project. So there are some useful ideas that can be implemented in this project from other similar projects.

Besides that, when reviewing the previous works or project a proper expect how this project can be conducted and the features that have to be added to make this project reliable and marketable are enlightened. By reviewing the previous works or project also have been referred to carefully before kick start this project to produce a better and more relevant system to the targeted market. Then, the theories and related knowledge are also important matter to develop this project. It has been acquired and implemented in achieving the objectives of this project.

2.2 Transmitter Schematic Circuit and Block Diagram

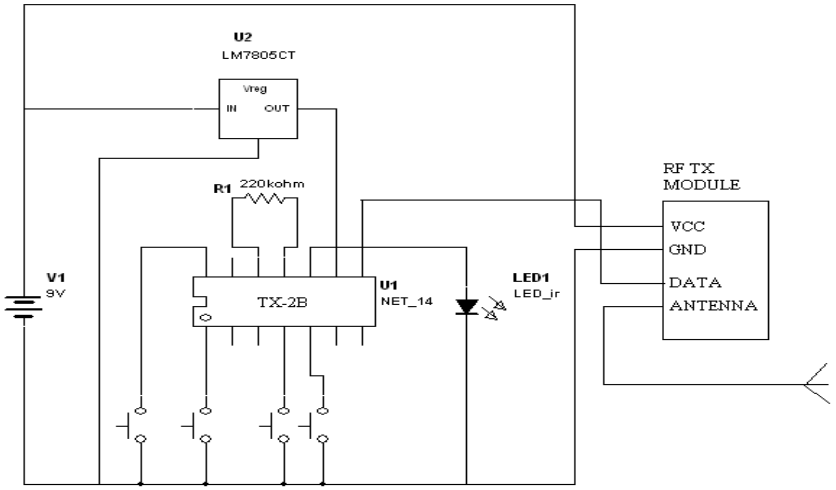

Figure 2.2 (a): Transmitter circuit

The RF transmitter is used to transmit the signal to the RF receiver circuit by using the transmitter control module. The antenna will transmit and synchronized the send signal to the receiver circuit. [5]

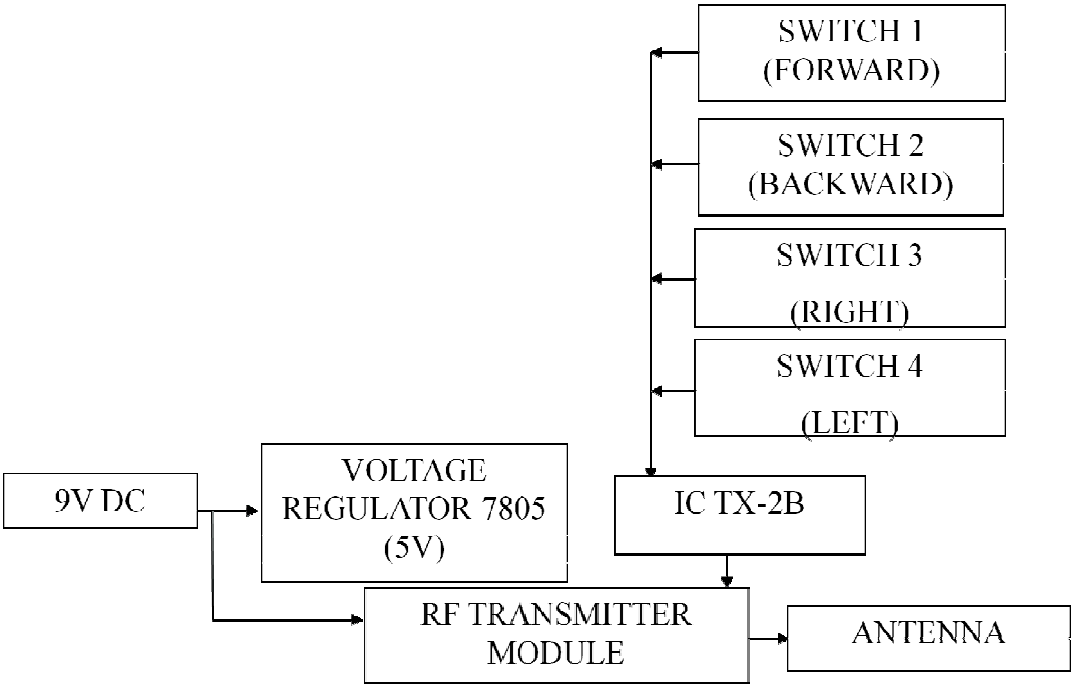

Figure 2.2 (b): Transmitter block diagram.

Figure 2.2(a) and figure 2.2(b) shows the transmitter schematic circuit and block diagram for the RF operation. 9V DC is supplied as an input to the voltage regulator. The voltage regulator (LM7805CT) will convert the 9V DC supply to 5V DC supply. 5V DC supply is then use to activate the Integrated Circuit (IC) transmitter 2B (IC TX-2B) and Integrated Circuit (IC) receiver 2B (IC RX-2B). [5]

2.3 Receiver Schematic Circuit and Block Diagram

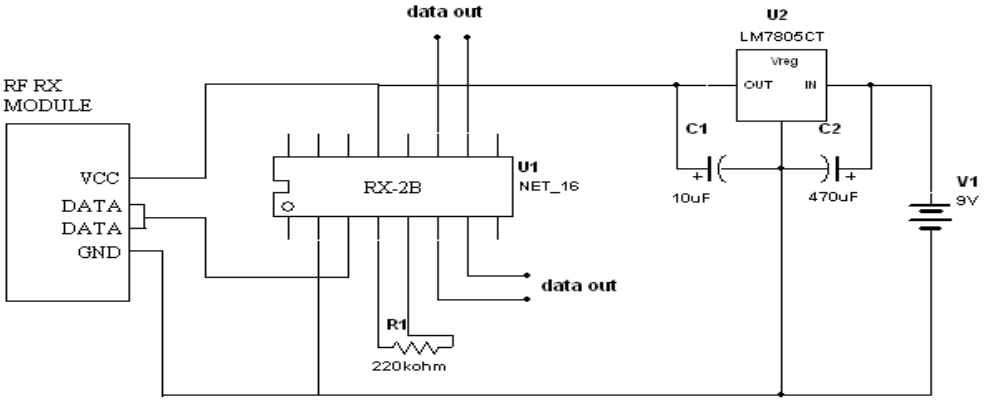

Figure 2.3 (a): Receiver circuit.

The RF receiver circuit is use to receive a signal from the transmitter antenna by the RF receiver module. The received signal will be send to the IC RX-2B. The IC RX-2B IC will trigger the relays coil to provide an output function circuit to operate the motor. [5]

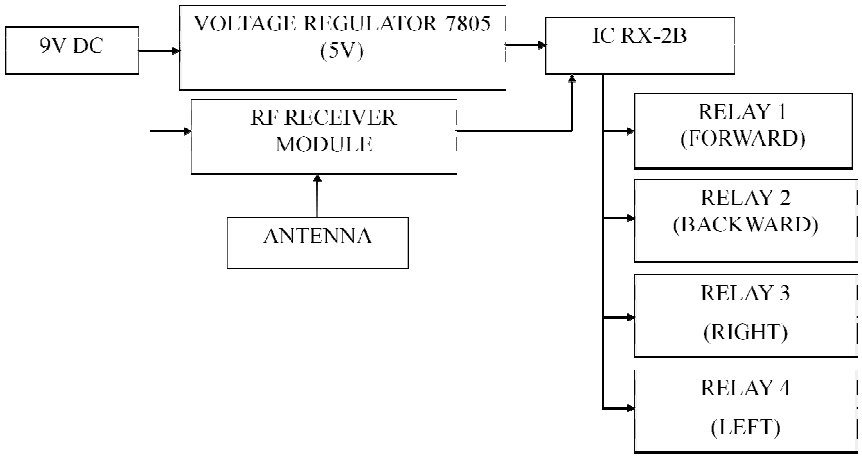

Figure 2.3 (b): Receiver block diagram.