

# BABY WALKER WITH RFID SYSTEM

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PROJEK SARJANA MUDA II**

**Tajuk Projek** : BABY WALKER WITH RFID SYSTEM

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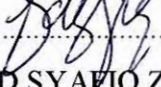
  
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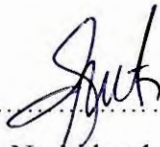
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Specially dedicated to  
My beloved parents, brother, sister and my lover who have encouraged, guided and  
inspired me throughout my journey of education

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## ABSTRACT

Baby Walker with RFID System is a baby walker that equipped with RFID system for safety purpose. This system consist of a RFID tag that sealed on the baby walker, RFID antenna, RFID reader to interrogating the RFID tag and software to controlling the hardware and decoding the responses from the tag. The reader of the RFID will be placed at potentially hazardous places such as bathroom, kitchen, stairs and doors. When the tag at the baby walker is detected by the reader, the reader will trigger an alarm, which means this system will alert the parents about the position of their baby. Serious accident and fatality can be avoided by using this system. This project can be achieved by combining the RFID interrogator system and the middleware part. Certain software is required in order to make sure the computer can communicate with the reader of RFID and the software that related will be discussed later on. As a result, this project already functioned. The RFID that already been sealed at the baby walker can be detected by the reader. This shows that the communication between the reader and the middleware is successful. This project can provide added value to the existing baby walker in the market.



## ABSTRAK

Projek ini merupakan projek 'baby walker' yang dilengkapi dengan system RFID dimana tujuannya adalah untuk keselamatan. Projek ini dilengkapi dengan tag RFID yang akan dilekatkan pada baby walker, antenna RFID, pembaca RFID dan juga perisian yang akan digunakan untuk mengawal dan memproses sistem tersebut. Antena RFID tersebut akan diletakkan di tempat-tempat yang agak berbahaya bagi kanak-kanak untuk menggunakan 'baby walker' seperti pintu hadapan rumah, dapur dan lain-lain tempat. Apabila antenna RFID mengesan kewujudan tag RFID, maka pembaca yang disambungkan kepada antenna akan memicu penggera dan berbunyi dimana system ini dapat membantu ibu bapa mengetahui tentang keadaan anak mereka yang sedang menggunakan 'baby walker'. Kes kemalangan dan kehilangan dapat dielakkan dengan menggunakan system ini. Projek ini dapat berjalan apabila bahagian pembaca dan juga perisian computer dapat berkomunikasi. Beberapa perisian diperlukan untuk menjalankan program RFID ini maka hal ini akan dibincangkan kemudian.



## TABLE OF CONTENT

<b>CHAPTER</b>	<b>TITLE</b>	<b>PAGE</b>
	<b>PROJECT TITLE</b>	<b>i</b>
	<b>CONFESSION</b>	<b>ii</b>
	<b>DEDICATION</b>	<b>v</b>
	<b>ACKNOWLEDGEMENT</b>	<b>vi</b>
	<b>ABSTRACT</b>	<b>vii</b>
	<b>ABSTRAK</b>	<b>viii</b>
	<b>TABLE OF CONTENT</b>	<b>ix</b>
	<b>LIST OF TABLE</b>	<b>xii</b>
	<b>LIST OF FIGURE</b>	<b>xiii</b>
	<b>LIST OF ABBREVIATION</b>	<b>xv</b>
<b>I</b>	<b>INTRODUCTION</b>	<b>1</b>
	1.1 Background project	1
	1.2 Problem statement	3
	1.3 Objective	4
	1.4 Scope of Project	5
	1.5 Thesis outline	6

<b>II</b>	<b>LITERATURE REVIEW</b>	<b>7</b>
2.0	History of RFID Technology	7
2.1	RFID in general	9
2.11	Comparison between RFID with Bar Code Technology	10
2.12	Benefits of RFID	11
2.13	Disadvantages of RFID	11
2.2	Component of RFID	12
2.21	Tags and Readers	12
2.22	Middleware and Servers	14
2.23	Active RFID Systems	17
2.24	Passive RFID Systems	18
2.3	RFID Frequencies	21
2.4	Operation of RFID Systems	23
2.4.1	RFID Building Blocks	23
2.4.2	RFID Block Schematic	23
2.4.3	Handshaking with the Reader (interrogator)	24
2.4.4	Backscatter Modulation	25
2.4.5	Operating principles of RFID systems	26
2.4.6	Inductive Coupling	27
2.4.7	Backscatter Coupling	30

2.5	Physical background of RFID systems	32
2.5.1	Dip generated at reader coil by EAS RF-transponder	32
2.5.2	Inductive reader-coil: circle radius vs. field strength	33
2.6	Baby walker	34
2.6.1	The study about baby walker	34
2.7	About Visual basic	37
2.7.1	Advantages of Visual Basic	38
<b>III</b>	<b>METHODOLOGY</b>	<b>39</b>
3.0	Project Methodology	39
3.1	Flowchart elaboration	42
3.1.1	Analysis of the project requirement	42
3.1.2	Configuring the RFID device	43
3.1.3	Create the interface system using visual basic software	45
3.1.4	Run the coding without error	45
3.1.5	Model testing	45
3.2	Project progress	46

<b>IV</b>	<b>RESULT</b>	<b>47</b>
4.1	The main plan	47
4.1.1	Electronics	47
4.1.2	Mechanical	48
4.2	Result of the project	49
4.3	Main window in Visual Basic	50
4.3.1	Coding for main window form	50
4.2	Alarm form	51
<b>V</b>	<b>CONCLUSION AND FUTURE WORK</b>	<b>53</b>
5.1	Conclusion	53
5.2	Recommendation	54
	<b>REFERENCES</b>	<b>55</b>
	<b>APPENDIX</b>	<b>56</b>

**LIST OF TABLES**

<b>NO</b>	<b>TITLE</b>	<b>PAGE</b>
2.0	Comparison between RFID and Barcode	10
2.2	Differences between a Passive and Active RFID tags	20
2.30	Application base on frequency allocation	21
2.31	Frequency range for RFID system	22
2.61	Accident record	36
2.62	Accident record	36
3.0	Gantt chart	46

## LIST OF FIGURES

NO	TITLE	PAGE
2.0	Watson-Watt with the first radar apparatus	8
2.2	Active tags can broadcast signals over long distances	17
2.21	Tags comes in many form factors	19
2.4	RFID block diagram	24
2.41	Modulated carrier signal	25
2.42	Inductive coupling	28
2.43	sample circuit of the power supply and load modulator in a transponder	29
2.44	Operation principle of a backscatter transponder	30
2.5	RF Transponder	32
2.51	circle radius vs. field strength	33
2.6	A photograph of a baby using a baby walker from 1905	34
2.61	Ordinary baby walker	37
3.0	Flowchart of the project	41
3.1	The antenna of RFID	42
3.2	The reader of RFID	43
3.3	Administrator console login	43
3.4	Administrator main console	44
3.5	Architechture of the RFID	44
4.0	The design of mechanical shaft	48
4.1	Main window	50
4.2	Alarm window	51



4.3 Successful response by using query tag

52

## **CHAPTER 1**

### **INTRODUCTION**

#### **1.1 Background of Project**

This project is all about the RFID where the main part is the implementation of this technology into the baby walker. The main idea of this project is to combine the RFID and the baby walker in the sense of the baby walker is equipped with this technology and can be used as a safety and alerting system. The initiative to do this project comes when the author of this project experienced the feeling of trauma when he discovers his niece already at the outside of the house with her baby walker. This happens due to careless in monitoring infant with baby walker.

Before going through to the next chapter, it is better to understand a short brief about RFID and the programming. In general terms, RFID (Radio Frequency Identification) is a means of identifying a person or object using a radio frequency transmission. The technology can be used to identify, track, and sort of detect a wide

variety of objects. Communication taken place between a reader (interrogator) and a transponder (silicon chip connected to antenna) often called a tag. Tag can either be active (powered by battery) or passive (powered by the reader field), and come in various forms including smart cards, tags, labels watches and even embedded in mobile phones. The communication frequencies used depends to a large extent on the application, and range from 125KHz to 2.5GHz. Regulations are imposed by most countries (grouped in 3 regions) to control emission and prevent interference with other industrial, scientific and medical equipment (ISM) [1].

For the programming part, this type of RFID can be programmed by various type of programming language such as C++, C#, C programming, Visual Basic etc. Visual Basic 2008 software has been selected by the author to program the operation of the detecting tag by the reader. The memory of the reader need to be manipulated by the visual basic in order to get the response of the detection.

## 1.2 Problem Statement

### 1. Injuries cause by using baby walker.

Babies that using baby walker have been associated with bums, head trauma and other types of injury. The most serious injuries were skull fractures, with the most common mechanism being of a fall downstairs in the walker.

### 2. Parents tend to be careless while monitoring their children

Most of babies learn to walk by using a baby walker. But still the surveillance of the parents is required at most. Accidents and injuries can happen is due to careless and unaware parents observing their babies using a baby walker.

### 3. Unsecured parameter where babies using the baby walker

Some places at the house are not suitable for using a baby walker such as stairs and outside of the house area because the baby can be exposed to danger. By installing this system into the baby walker, it might help parents to reduce the problems that occurred.

### 1.3 Objective

There are three objectives for this project:-

1. To operate and control the RFID system
  - Understanding the RFID console operation and configure the function of the console.
  
2. To develop the software that will be used to control the operation
  - Understanding the requirement of the software and the reader.
  - To make sure the software developed works with the RFID system.
  
3. To develop the prototype of this project
  - This prototype should be use in the house means it is not for outdoor application.
  
4. To achieved good result in this project
  - Able to complete the task given during this project still in progress.

In order to achieve the entire objective that I have stated, the scope and the sequences of the project methodology and process must be followed.

## 1.4 Scope of Project

The scopes are listed to ensure the project is conducted within its intended boundary. It also to ensure the project is heading in the right direction to achieve its objectives, the scopes of work of this project are to study the basic of a RFID system from several published papers and books, and study about mechanism that can stop the baby walker and also the circuits that involved in this project.

The main focus for this project is to apply what already learned about the radio frequency system. The parameters for this project can be classified as:-

- The system of RFID
- The basic movement for baby walker
- The interface between RFID and computer
- The programming of the reader and Visual Basic
- The implementation of this project into the market demand

The project will be studied and analyzed so that during the testing and simulation, the good result can be achieved. Last but not least to develop a prototype to implement it into the real life.



## 1.5 Outline of Thesis

This report represents five chapters. The following is the outline of the design/analysis of Laser range meter project in chapter by chapter.

- Chapter 1: This chapter is discussing about the overview of the project such as introduction, objective, problem statement and scope of the project.
- Chapter 2: This chapter describes about the research and information about the RFID system and the project. Every facts and information which found through books or other references will be discussed on this chapter.
- Chapter 3: This chapter discuss about the project methodology used in this project such as data capture and comparison process. All these methodology should be followed for a better performance.
- Chapter 4: This chapter describes about the project the findings such as result and analysis of the electronics component.
- Chapter 5: Discussion and conclusion achieved in this project.

## **CHAPTER 2**

### **LITERATURE REVIEW**

This chapter presents the background theory of RFID system including its characteristics that are useful in order to develop this project. The details of RFID system are discussed and followed by explanation on the measurement principles.

#### **2.0 History of RFID Technology**

Radio frequency identification has been around for decades. Learn how it evolved from its roots in World War II radar systems to today's hottest supply chain technology. It's generally said that the roots of identification technology can be traced back to World War II. The Germans, Japanese, Americans and British were all using radar which had been discovered in 1935 by Scottish physicist Sir Robert Alexander Watson Watt to warn of approaching planes while they were still miles away. The problem was there was no way to identify which planes belonged to the enemy and which were a country's own pilots returning from a mission[1].

The Germans discovered that if pilots rolled their planes as they returned to base, it would change the radio signal reflected back. This crude method alerted the radar crew on the ground that these were German planes and not allied aircraft. This is, essentially, the first passive RFID system.

Under Watson-Watt, who headed a secret project, the British developed the first active identify friend or foe (IFF) system. They put a transmitter on each British plane. When it received signals from radar stations on the ground, it began broadcasting a signal back that identified the aircraft as friendly. RFID works on this same basic concept. A signal is sent to a transponder, which wakes up and either reflects back a signal (passive system) or broadcasts a signal (active system).

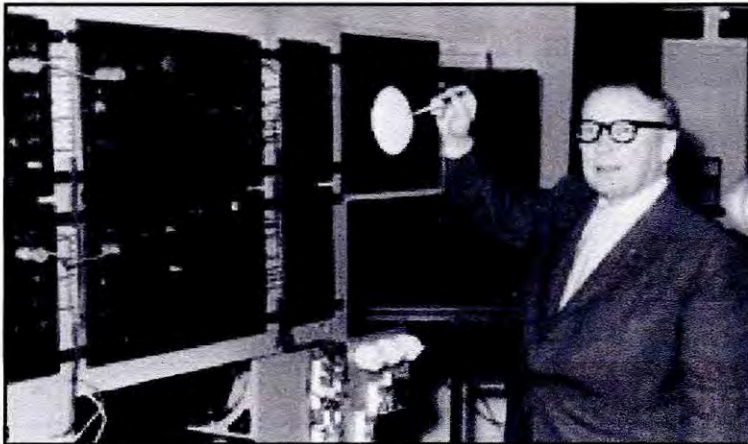


Figure 2.0: Watson-Watt with the first radar apparatus

Advances in radar and RF communications systems continued through the 1950s and 1960s. Scientists and academics in the United States, Europe and Japan did research and presented papers explaining how RF energy could be used to identify objects remotely. Companies began commercializing anti-theft systems that used radio waves to determine whether an item had been paid for or not. Electronic article surveillance tags, which are still used in packaging today, have a 1-bit tag. The bit is either on or off. If someone pays for the item, the bit is turned off, and a person can leave the store. But if the person doesn't pay and tries to walk out of the store, readers at the door detect the tag and sound an alarm.

## **2.1 RFID in general**

RFID is a technology that enables identification of a tag (that is normally attached with an entity) by using electromagnetic waves. The function served by RFID is similar to bar code identification, but line of sight signals are not required for operation of RFID. Important components of an RFID system are:

- An RFID reader (also called transceiver) with an antenna and a transceiver,
- A transponder (Also called a tag) that includes an antenna and a chip)