

**ANALYZING THE IMPROVEMENT OF THE RECEIVER SIGNAL LEVEL AND  
RECEIVER SIGNAL QUALITY IN TERENGGANU**

**This thesis is presented in partial fulfillment for the award of the Bachelor of  
Electrical (HONS) Engineering**



**UNIVERSITI  
TEKNOLOGI  
MARA**

**ROSZANA BINTI HASHIM**

**FACULTY OF ELECTRICAL ENGINEERING**

**UNIVERSITI TEKNOLOGI MARA**

**40450 SHAH ALAM SELANGOR**

**MALAYSIA**

## **ACKNOWLEDGEMENT**

All praises be to the Al-Mighty Allah S.W.T, the Merciful and Beneficent for the strength and blessing that has been bestowed upon me throughout the entire research and completion of this thesis. Peace is upon our prophet Nabi Muhammad S.A.W who has given light to mankind.

I wish to express my sincere appreciation and gratitude to my respected supervisor, Assoc Prof Norhayati binti Ahmad for her guidance, comments, encouragement and constant support during the period to complete this thesis. Also thanks to Encik Mohd Fauzi, lecturer in Faculty of Electrical Engineering UiTM Shah Alam for his time in helping and giving advice to achieve the objectives of my final year project.

My thanks are also extended to all staff of Optic Global Sdn. Bhd especially to its manager, Mr. Vincent Hsu for his permission to use communication data from his company. At the same time, he has helped me with the results for my thesis.

I am also greatly indebted to all my panels, Cik Noor hafizah Binti Abdul Aziz and Puan Norhayati Binti Hamzah for their useful comments on my technical paper and during the presentation of my project.

Last but not least, my utmost thanks go to all my family members especially to my mother and my beloved friend who have tirelessly pray and give useful advice for me to proceed with my project until it is successful.

## **ABSTRACT**

The aims of this project are to study receiver signal level and receiver signal quality in the different situation such as the comparison result about receiver signal level and receiver signal quality before and after the repeater were placed at the sample area. The project started with the application of using the coverage area data from OPTIX GLOBAL SDN BHD. The data was converted from TEMS software to database using Oracle Database 10g Express Edition software. The Oracle database 10g Express Edition was chosen because this is a one of the multifunction database such as the Oracle Database 10g Express Edition software which can manage the collected data and store the data at the same time. Finally, the data at the database will be simulated using the MATLAB software to plot the graph pattern of the receiver signal level and receiver quality level before and after the repeater is placed at the sample area. In addition, the programming command was designed based on the range of the signal value to display the condition of the receiver signal level and receiver signal quality at the sample area.

# TABLE OF CONTENTS

<b>CHAPTER</b>	<b>DESCRIPTION</b>	<b>PAGE</b>
<b>1</b>	<b>INTRODUCTION</b>	
	1.1 Receiver Signal Level	1
	1.2 Receiver Signal Quality	4
	1.3 Project Background	5
	1.4 Project Objective	6
	1.5 Project Overview	6
<b>2</b>	<b>WIRELESS COMMUNICATION THEORY</b>	
	2.1 Introduction	7
	2.2 Mobile Phone Network	8
	2.2.1 GSM Network Architecture	8
	2.2.2 Cellular Telephone Network	9
	2.3: Traffic Capacity and Trunking	10
	2.3.1 Example of GOS situation	12
<b>3</b>	<b>APPLICATION SOFTWARE AND DATABASE</b>	
	3.1 Introduction to Software	15
	3.1.1 Application of TEMS software	15
	3.2 Introduction to Database Management	16
	3.2.1 Application of Oracle Database 10g Express Edition	17
	3.3 Introduction to the MATLAB language	20
	3.3.1 Programming briefing	21
	3.3.2 Loops and Logical statements	22

<b>4</b>	<b>METHODOLOGY</b>	
	4.1	Methodology 23
	4.2	Detail Procedures 25
	4.2.1	Introduction 25
	4.2.2	Analyze collecting data use TEMS Software 26
	4.2.3	Store and manage the collecting data use Oracle Database 10g Express Edition software 29
	4.2.4	Simulation use Matlab software 35
<b>5</b>	<b>RESULT AND DISCUSSION</b>	
	5.1	Result and Discussion 37
	5.2	Future Recommendation 48
<b>6</b>	<b>CONCLUSION</b>	
	6.1	Conclusion 49

**REFERENCES**

**APENDICES I**

**APENDICES II**