

# **Development of New Terminal Node Controller to Improve Packet Radio Transmission for Field Data Acquisition**

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MOHAMAD SYAHMI BIN ZULLKIFFLE  
FACULTY OF ELECTRICAL ENGINEERING  
UNIVERSITI TEKNOLOGI MARA  
40450 SHAH ALAM,  
SELANGOR

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## **ABSTRACT**

The existing terminal node controller (TNC) has problem during transmit and receive packet of data as a result of noise interference during the transmission of packet data. Implementation of packet radio network in field data acquisition should have a good performance of TNC. This project will improve the performance of existing TNC in packet radio transmission for field data acquisition. The modem integrated circuit, MX614 (Bell 202 Compatible Modem) is applied in the circuit to minimize the noise interference and improve the performance of TNC in data transmission. The modem integrated circuit of MX614 has the capability to filter and equalize the input signal as well as filter and buffer the output signal. This modem integrated circuit converts the data received from microcontroller into 1200 bps audio tones. The features of this modem integrated circuit will improve the performance of TNC in packet data transmission.

## TABLE OF CONTENTS

<b>DECLARATION</b> .....	<b>i</b>
<b>DEDICATION</b> .....	<b>ii</b>
<b>ACKNOWLEDGEMENT</b> .....	<b>iii</b>
<b>ABSTRACT</b> .....	<b>iv</b>
<b>TABLE OF CONTENTS</b> .....	<b>v</b>
<b>LIST OF FIGURES</b> .....	<b>viii</b>
<b>LIST OF TABLES</b> .....	<b>xi</b>
<b>LIST OF ABBREVIATIONS</b> .....	<b>xii</b>
<b>LIST OF EQUATION</b> .....	<b>xiii</b>
<b>CHAPTER 1</b> .....	<b>1</b>
1.1    PROJECT BACKGROUND.....	1
1.2    PROBLEM STATEMENTS.....	2
1.3    PROJECT OBJECTIVES .....	2
1.4    SCOPE OF PROJECT .....	3
1.5    OUTLINE OF THESIS.....	3
<b>CHAPTER 2</b> .....	<b>6</b>
2.1    INTRODUCTION.....	6
2.2    OVERVIEW OF PACKET RADIO NETWORK.....	6
2.3    ELEMENTS IN PACKET RADIO NETWORK.....	8
2.3.1 Terminal Node Controller .....	8
2.3.1.1 The Structure of TNC.....	8
2.3.2 Computer or Terminal.....	9
2.3.3 Radio FM Transceiver.....	10
2.4    PRINCIPLE OF OPERATION OF AN EXISTING TNC.....	12
2.4.1 System Operation Block Diagram .....	12
2.4.2 Complete Schematic Diagram of an Existing TNC .....	13

# CHAPTER 1

## INTRODUCTION

### 1.1 PROJECT BACKGROUND

TNC is a device which is used in packet radio network. In 1981, there is first development of TNC by Vancouver Amateur Digital Communication Group (VADCG). The TNC usually has been used in amateur radio communication for packet data transmission.

The applications of TNC in packet data transmission enabled the data acquisition for example to acquire data in certain area that does not have GSM coverage. For system of the packet radio network, TNC will be placed between amateur radio transceiver and computer or data logger. The main function of TNC in transmission of packet data in packet radio network is to encode and decode the packet data that has been framed according to the AX.25 data link layer protocol [1]. Generally, TNC is applied in the research field and data acquisition purposes [2]. The TNC also influence the performance of data transmission in packet radio network [3].

At the physical level, TNC implement the Bell 202 Modem standard to send and receive data to or from an amateur radio transceiver. The radio itself is responsible for transforming the audio input and output into radio frequency signals. The Bell 202 Modem standard is simply Audio Frequency Shift Keying (AFSK) at 1200 baud with continuous phase using the audio tones frequency of 1200 Hz and 2200 Hz. In amateur radio application, non-return to zero inverted (NRZI) encoding is