

**PC BASED ISDN PHONE  
(DATA TRANCEIVER VIA D-CHANNEL)**

**This is presented in partial fulfilment for the award of the  
Degree in Electrical Engineering of INSTITUT TEKNOLOGI MARA.**



**BUSTANI BIN RAMLI**  
*Department of Electrical Engineering*  
**INSTITUT TEKNOLOGI MARA**  
40450 Shah Alam, Selangor.  
**OCTOBER 1997.**

## **Acknowledgments**

It is a pleasure to acknowledge the help that I have received from several individuals in the preparation of this thesis. I thank particularly Dr. Deepak Kumar Ghodgaonkar, who was my project supervisor for his guidance, ideas and patience in advising and assisting of this project. I also thank lecturers and classmates for their supporting and contribution to this project. I am grateful to En. Ismail Mat Yusoff of MIMOS for his help in several ways.

**Bustani bin Haji Ramli**  
**INSTITUT TEKNOLOGI MARA**  
**Shah Alam**  
**Selangor.**

## **Abstract**

The MT8992-Digital Phone(D-Phone) and MT8930-Subscriber Network Interface Circuit(SNIC) devices are presented in this project developement. The D-Phone is a fully integrated digital telephone I.C designed for used in a Terminal Equipment. It incorporates an on-chip Codec, a tone ringer, a DTMF generator, speaker-phone algorithm, an interface to standard telephony transducers and HDLC Transceiver which transmit and receive the packetized data (information or control) serially in a frame format.The SNIC is a device which implements the CCITT 1.430 recomendation for the ISDN S Reference Points. Providing point-to-point digital transmission, the SNIC may be used at either end of the subscriber line (NT or TE).The two devices can be controlled by a microprocessor or ST-Bus(serial Bus) for interfacing.

---

**CONTENTS****Page No**

---

<b>Acknowledgement</b>	<b>iii</b>
<b>Abstract</b>	<b>iv</b>
<b>CHAPTER 1</b>	
<b>INTRODUCTION</b>	
<b>1.1 Telecommunications</b>	<b>1</b>
<b>1.2 Historical Perspective</b>	<b>2</b>
<b>CHAPTER 2</b>	
<b>BACKGROUND THEORY</b>	
<b>2.1 Integrated Services Digital Network (ISDN)</b>	
2.1.1 <u>Introduction</u>	<b>3</b>
2.1.2 <u>Transmission Structure</u>	<b>4</b>
2.1.2.1 ISDN Channels	<b>4</b>
2.1.2.2 Access Interfaces	<b>6</b>
2.1.3 User-Network Interfaces	<b>7</b>
2.1.3.1 Functional Devices	<b>7</b>
2.1.3.2 Reference Points	<b>8</b>
2.1.4 ISDN Protocols	<b>9</b>
<b>2.2 ISDN Services</b>	<b>10</b>

# CHAPTER 1

## INTRODUCTION

### 1.1 Telecommunications

Our global telecommunications network makes it possible for a person to pick up a telephone, dial a number, and speak to someone in almost any country on any continent in the world.

The network also enables us to communicate with computers by voice (and other means) in most places throughout the world. Many events and complex processes take place in the completion of such calls. Often, the cooperative efforts of several companies and millions of dollars worth of switching, signalling, and transmission equipment and other facilities are combined to make the call possible.

Telecommunications is generally used to denote the totality of techniques and circuits necessary for optimum information transfer via a given transmission medium, in the presence of noise and other possible forms of interference.

#### Information Sources:

**Division according to the nature of the information to be transmitted**

