

USER'S MANUAL

PC-320

**386SX-40
MINI BOARD
W/ LAN/SSD/VGA**

PC-320-M1

***PC-320 MINI BOARD
W/ LAN/SSD/VGA***

OPERATION MANUAL

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This operation manual is meant to assist both Embedded Computer manufacturers and end users in installing and setting up the system. The information contained in this document is subject to change without any notice.

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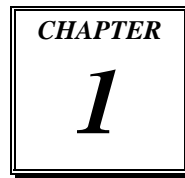
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INTRODUCTION



This chapter gives you the information for PC-320. It also outlines the System specification.

Sections include:

- About This Manual
- System Specifications
- Safety precautions

Experienced users can skip to chapter 2 on page 2-1 for a Quick Start.

1-1. ABOUT THIS MANUAL

Thank you for purchasing PC-320 Mini Board with LAN/SSD/VGA, fully DOS Command compatible. The PC-320 is designed as controller or work-station. Its standard SBC functions and other featuring make this CPU Card more suitable for harsh industrial environment and commercial application. This manual is written to assist you how to install and set up the system. It contains four chapters. The user can apply this manual for configuration according to the following chapters:

Chapter 1 Introduction

This chapter introduces you the background of this manual, and the specification for this system. Final in this chapter will show you how to avoid damaging this Embedded CPU board.

Chapter 2 Hardware Configuration

This chapter outlines the components' locations and their functions. In the end of this chapter, you will know how to set jumper and how to configure this board to meet your own needs.

Chapter 3 Software Utilities

Helpful information that informs you the proper installation of VGA, LAN, Flash BIOS, and it also describes the Watchdog-timer function.

Chapter 4 AMI BIOS Setup

This chapter shows you how to set up the AMIBIOS configurations.

Appendix A Expansion Bus

This Appendix introduces you the expansion bus for PC-104.

Appendix B Technical Summary

This section gives you the information about the AMIBIOS Identification Strings and Technical maps.

Appendix C Trouble Shooting

This section outlines the errors and suggestions for solving the problems.

1-2. SYSTEM SPECIFICATION

- **CPU :**
386SX-40 CPU built on board.
- **MEMORY :**
Up to 16MB DRAM. (Note: Do not use double bank).
Two 72pin SIMM socket on board.
- **REAL-TIME CLOCK / CALENDAR :**
CMOS data back up from BIOS set or BIOS default.
Dallas 12887 Real Time Clock.
- **BIOS :**
AMI, Flash BIOS for plug & play function.
Easy update 128KB flash EEPROM.
Support S/IO Setup.
- **KEYBOARD CONNECTOR :**
5-pin PC/AT type connector.
Support PC/AT Keyboard.
- **BUS SUPPORT :**
Internal ISA, external PC-104 ISA BUS.
- **WATCHDOG :**
I / O port 443H to enable watchdog.
I / O port 441H to disable watchdog.
Time-out timing select 0 / 8 / 16 / 24 / 32 / 40 / 48 / 56 / 64 / 72 / 80 /
88 / 96 / 104 / 112 / 120 sec +/- 25%.
- **IDE INTERFACE :**
ISA IDE, 1 Channel support 2 devices.
- **FLOPPY DISK DRIVE INTERFACE :**
Support up to two Floppy Disk Drivers, 3.5" and 5.25" (360K / 720K /
1.2M / 1.44M / 2.88M).

● **SERIAL PORT :**

Two high speed 16550 Compatible UARTs with Send / Receive 16
Byte FIFOs; COM1 : RS-232; COM2 : RS-232/422/485
MIDI Compatible.
Programmable Band Rate Generator.

● **VGA :**

Support CRT & LCD Flat Panel.
LCD Mode: Mono/Color/STN/TFT/EL

● **SSD :**

Disk-on-chip Socket, support up to 72MB Solid State Disk.

● **LAN :**

10 Mbps transfer rate; support for UTP and BNC ports.

● **PARALLEL PORT :**

SPP, ECP, EPP Function.
Bi-direction parallel port.

● **LED INDICATOR :**

System power.
Hard Disk access.
Turbo function mode.

● **PC-104 BUS EXPANSION & SPEED :**

ISA 8MHz
PC-104 8MHz

● **DMA CONTROLLER :**

82C37 x 2

● **DMA CHANNELS :**

7

● **INTERRUPT CONTROLLERS :**

82C59 x 2

● **INTERRUPT LEVELS :**

15

● **STORAGE TEMPERATURE :**

-40 to 80°C.

● **OPERATING TEMPERATURE :**

0 to 60°C.

● **SYSTEM POWER REQUIREMENT :**

DC Voltage: +5V, minimum +4.75V, maximum 5.25V.

DC Ampere: 5A

DC Voltage: +12V, minimum +11.4V, maximum 12.6V.

DC Ampere: 500mA

● **BOARD DIMENSION :**

102mm X 145mm

● **BOARD WEIGHT :**

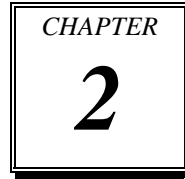
0.25 Kg.

1-3. SAFETY PRECAUTIONS

Follow the messages below to avoid damaging your system and hurting yourself:

1. Avoid your system from static electric on all occasions.
2. Stay safe from the electric shock. Don't touch any components of this card when the card is on. Always disconnect power when the system is not in use.
3. Disconnect power when you change any hardware devices. For instance, when you connect a jumper or install any cards, a surge of power may damage the electronic components or the whole system.

HARDWARE CONFIGURATION



***** QUICK START *****

Helpful information details you the jumper & connector settings, and components locations.

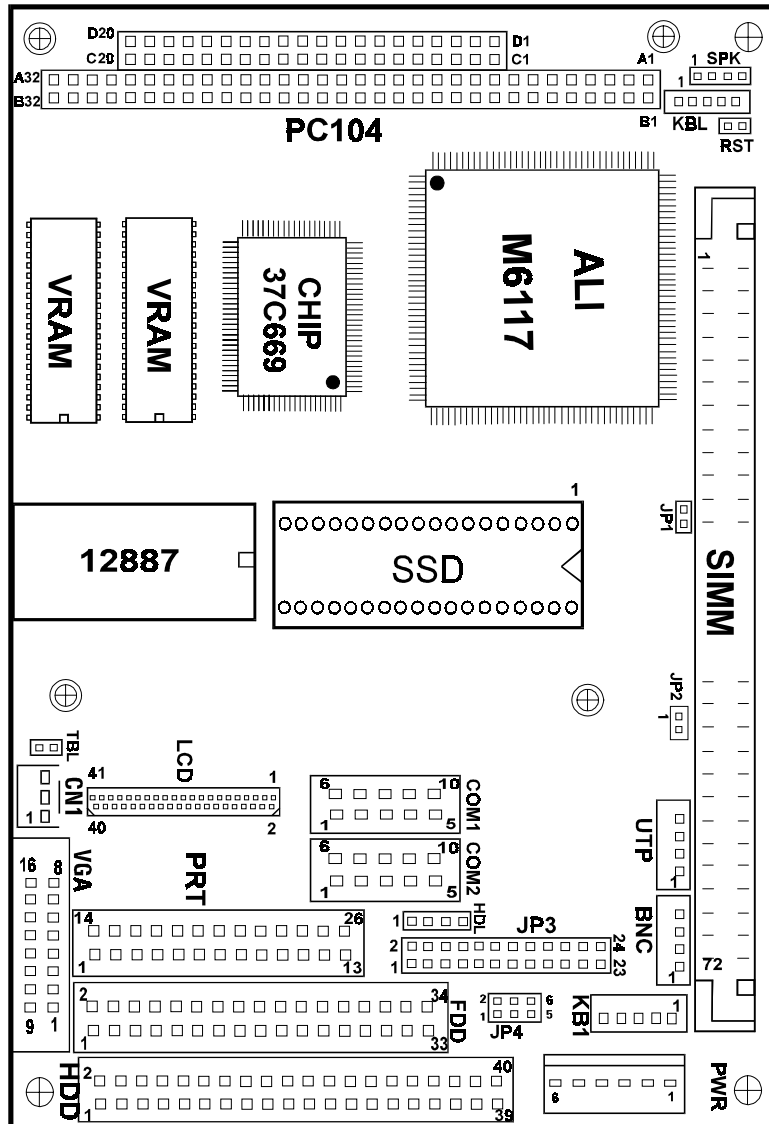
Sections include:

- Jumper & Connector Quick Reference Table
- Components' Locations
- Configuration and Jumper settings
- Connector Pin Assignments

2-1 JUMPER & CONNECTOR QUICK REFERENCE TABLE

RS-232/422/485 Selection for COM2	JP3
SSD Memory Map with Jumper Setting	JP4
COM1 Connector	COM1
COM2 Connector	COM2
Turbo LED Connector	TBL
Panel Power Connector	CN1
External Speaker Connector	SPK
Floppy Disk Drive Connector	FDD
Hard Disk Drive Connector	HDD
Hard Disk Drive LED Connector	HDL
Power LED & KeyLock Connector	KBL
External Keyboard Connector	KB1
Power Connector	PWR
Printer Connector	PRT
Reset Connector	RST
LAN Link LED Connector	JP2
LAN Active LED Connector	JP1
Sold-State-Disk Socket	SSD
LCD Panel Connector	LCD
BNC Connector	BNC
UTP Connector	UTP
Memory Installing	SIMM

2-2 COMPONENT LOCATIONS



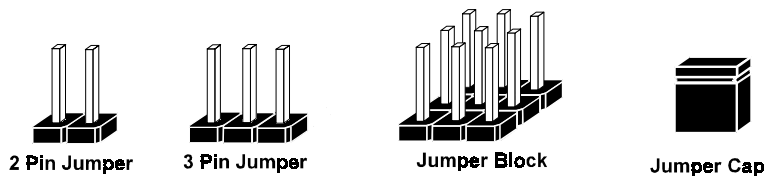
PC-320 Connectors, Jumpers and Components locations

2-3 HOW TO SET JUMPERS

You can configure your board by setting jumpers. A jumper consists of two or three metal pins with a plastic base mounted on the card, and a small plastic "cap" (with a metal contact inside) to connect the pins. So you can set up your hardware configuration by "open" or "close" the pins.

The jumper can be combined into sets which called jumper blocks. When the jumpers are all in the block, you have to put them together to set up the hardware configuration. The figure below shows how this looks.

JUMPERS AND CAPS

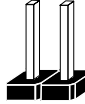


If a jumper has three pins, for examples, labelled PIN1, PIN2, and PIN3. You can connect PIN1 & PIN2 to create one setting and shorting. You can either connect PIN2 & PIN3 to create another setting. The same jumper diagrams are applied all through this manual. The figure below shows what the manual diagrams look and what they represent.

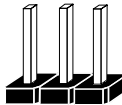
JUMPER DIAGRAMS



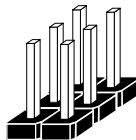
Jumper Cap like this



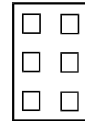
2 pin Jumper like this



3 pin Jumper like this



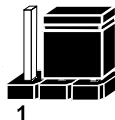
Jumper Block like this



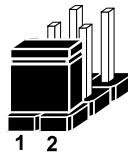
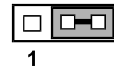
JUMPER SETTINGS



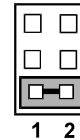
**2 pin Jumper close(enabled)
like this**



**3 pin Jumper
2-3 pin close(enabled)
like this**



**Jumper Block
1-2 pin close(enabled)
like this**



2-4 RS232/422/485 (COM2) SELECTION

JP3 : RS-232/422/485 Selection

COM1 is fixed for RS-232 function only.

COM2 is selectable for RS-232, 422, 485 functions with JP3.

The jumper settings are as follow :

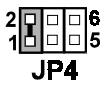
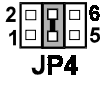
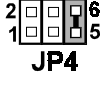
COM 2 Function	RS-232	RS-422	RS-485
Jumper setting (pin closed)		1-2 5-6 7-8 9-10 11-12 17-18 19-20 21-22 23-24	1-3 5-6 7-8 9-10 11-12 13-14 15-16 17-18 19-20 21-22 23-24
Jumper illustration	<p style="text-align: center;">JP3</p>	<p style="text-align: center;">JP3</p>	<p style="text-align: center;">JP3</p>

*** Manufactory default --- RS-232.

2-5 SSD MEMORY MAP WITH JUMPER SETTING

JP4: SSD Memory Mapping Selection.

The 32pin SSD socket supports a Disk-on-chip up to 72MB. This PnP Flash ROM SSD can be installed as one of user's hard disk drive. if set as Drive C, it can be used as a boot-up hard disk. The pin assignments of SSD Memory Mapping are as follow:

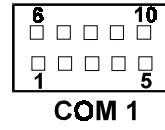
SSD Memory Map	JUMPER SETTING (pin closed) JP4	JUMPER ILLUSTRATION
D000h-D7FFh	1-2	 <p>2 1 6 5 JP4</p>
D800h-DFFFh	3-4	 <p>2 1 6 5 JP4</p>
E000h-E7FFh	5-6	 <p>2 1 6 5 JP4</p>

Note: No manufacturer's default setting is done on this SSD. User should set the jumper according to the following Memory Map.

2-6 COM1 CONNECTOR

COM1 : COM1 Connector is fixed for RS-232.
The COM1 Connector assignments are as follow :

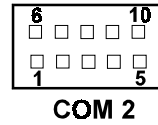
PIN	ASSIGNMENT
1	DCD
2	RX
3	TX
4	DTR
5	GND
6	DSR
7	RTS
8	CTS
9	RI
10	NC



2-7 COM2 CONNECTOR

COM2 : COM2 Connector is selectable with JP3 for RS-232/422/485.
The COM2 Connector assignments are as follow :

PIN	ASSIGNMENT		
	RS-232	RS-422	RS-485
1	DCD	TX-	TX-
2	RX	TX+	TX+
3	TX	RX+	RX+
4	DTR	RX-	RX-
5	GND	GND	GND
6	DSR	RTS-	NC
7	RTS	RTS+	NC
8	CTS	CTS+	NC
9	RI	CTS-	NC
10	NC	NC	NC

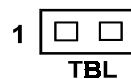


2-8 TURBO LED CONNECTOR

TBL : Turbo LED Connector

The pin assignments are as follows:

PIN	ASSIGNMENT
1	VCC
2	Turbo Signal

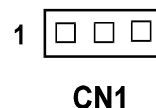


2-9 PANEL POWER CONNECTOR

CN1 : Panel Power Connector for VGA delay voltage.

The pin assignments are as follow :

PIN	ASSIGNMENT
1	LCD VDD (+5V)
2	GND
3	LCD +12V

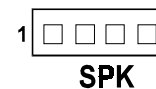


2-10 EXTERNAL SPEAKER CONNECTOR

SPK : External Speaker Connector

The pin assignments are as follow :

PIN	ASSIGNMENT
1	VCC
2	Speaker Signal
3	Speaker Signal
4	Speaker Signal

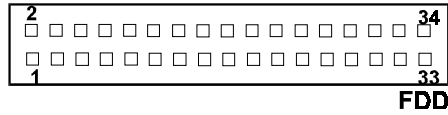


2-11 FLOPPY DISK DRIVE CONNECTOR

FDD : Floppy Disk Drive Connector

You can use a 34-pin daisy-chain cable to connect a two-FDDs. On one end of this cable is a 34-pin flat cable to attach the FDD on the board, the other side is to attach two FDDs.

The pin assignments are as follow :

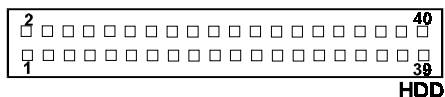


PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	GND	2	RPM
3	GND	4	NC
5	GND	6	RATE0
7	GND	8	INDEX
9	GND	10	MTR0
11	GND	12	DRV1
13	GND	14	DRV0
15	GND	16	MTR1
17	GND	18	DIR
19	GND	20	STEP
21	GND	22	WDATA
23	GND	24	WGATE
25	GND	26	TRK0
27	GND	28	WRPRT
29	GND	30	RDATA
31	GND	32	SEL
33	GND	34	DSKCHG

2-12 HARD DISK DRIVE CONNECTOR

HDD : Hard Disk Connector

The HDD disk pin assignments are as follow :

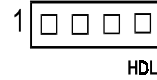


PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	REST	2	GND
3	D7	4	D8
5	D6	6	D9
7	D5	8	D10
9	D4	10	D11
11	D3	12	D12
13	D2	14	D13
15	D1	16	D14
17	D0	18	D15
19	GND	20	NC
21	NC	22	GND
23	IOW	24	GND
25	IOR	26	GND
27	IORDY	28	BALE
29	NC	30	GND
31	IRQ14	32	IO16
33	A1	34	GND
35	A0	36	A2
37	CS0	38	CS1
39	HDLED	40	GND

2-13 HARD DISK DRIVE LED CONNECTOR

HDL : Hard Disk Driver LED Connector
The pin assignments are as follow :

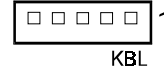
PIN	ASSIGNMENT
1	VCC
2	HDD Active Signal
3	HDD Active Signal
4	HDD Active Signal



2-14 POWER LED & KEYLOCK CONNECTOR

KBL : Power LED & Keylock Connector
The pin assignments are as follow :

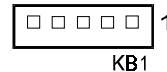
PIN	ASSIGNMENT
1	Power LED
2	NC
3	Ground
4	Keyboard INT
5	Ground



2-15 EXTERNAL KEYBOARD CONNECTOR

KB1 : External Keyboard Connector
The pin assignments are as follow :

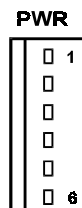
PIN	ASSIGNMENT
1	KBCLK
2	KBDATA
3	NC
4	GND
5	Vcc



2-16 POWER CONNECTOR

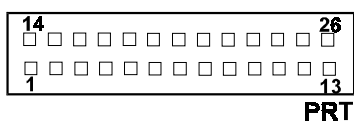
PWR : Power Connector
 The pin assignments are as follow :

PIN	ASSIGNMENT
1	NC
2	+5V
3	+12V
4	-12V
5	GND
6	GND



2-17 PRINTER CONNECTOR

PRT : Printer Connector
 As to link the Printer to the card, you need a cable to connect both DB25 connector and parallel port. The pin assignments are as follow :



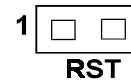
PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	STB	14	AUTFE
2	P0	15	ERROR
3	P1	16	INIT
4	P2	17	SLCTIN
5	P3	18	GND
6	P4	19	GND
7	P5	20	GND
8	P6	21	GND
9	P7	22	GND
10	ACK	23	GND
11	BUSY	24	GND
12	PE	25	GND
13	SLCT	26	NC

2-18 RESET CONNECTOR

RST : Reset Connector

The pin assignments are as follow :

PIN	ASSIGNMENT
1	Reset
2	Ground

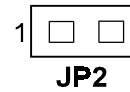


2-19 LAN LINK LED CONNECTOR

JP2 : LAN Link LED Connector

The pin assignments are as follow:

PIN	ASSIGNMENT
1	Pull hi Vcc
2	Link Signal

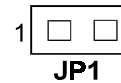


2-20 LAN ACTIVE LED CONNECTOR

JP1 : LAN Active LED Connector

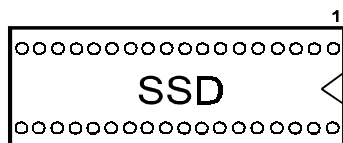
The pin assignments are as follow:

PIN	ASSIGNMENT
1	Pull hi Vcc
2	Active Signal



2-21 SOLID-STATE DISK SOCKET

SSD : 32-pin Disk on chip socket.
 The pin assignment are as follow:



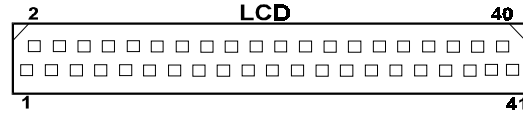
PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	NC	17	SD3
2	NC	18	SD4
3	NC	19	SD5
4	SA12	20	SD6
5	SA7	21	SD7
6	SA6	22	CE
7	SA5	23	SA10
8	SA4	24	OE
9	SA3	25	SA11
10	SA2	26	SA9
11	SA1	27	SA8
12	SA0	28	NC
13	SD0	29	NC
14	SD1	30	VCC
15	SD2	31	WR
16	GND	32	VCC

2-22 LCD PANEL CONNECTOR

LCD : LCD Panel Connector

The connector LCD is a 41-pin, dual-in-line header used for Flat Panel displays.

The pin assignments are as follow :



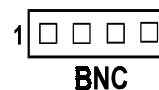
PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	P20	2	GND
3	P16	4	VCC
5	P21	6	P0
7	P17	8	P8
9	P22	10	P1
11	P18	12	P9
13	P23	14	P2
15	P19	16	P10
17	VCC	18	P3
19	FLM	20	P11
21	MDE	22	P4
23	LP	24	P12
25	SHFCLK	26	P5
27	3.3V	28	P13
29	3.3V	30	P6
31	ENABKL	32	P14
33	LCDVDD	34	P7
35	ENVEE	36	P15
37	GND	38	+12V
39	GND	40	+12V
41	NC		

2-23 BNC CONNECTOR

BNC : BNC Connector.

The pin assignments are as follow:

PIN	ASSIGNMENT
1	GND
2	RXI
3	ISOLATED
4	GND

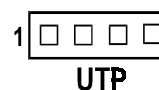


2-24 UTP CONNECTOR

UTP : UTP Connector.

The pin assignments are as follow:

PIN	ASSIGNMENT
1	TX+
2	TX-
3	RX+
4	RX-



2-25 MEMORY INSTALLING

The PC-320 local bus Embedded computer will support 2 DRAM banks, bank 0, and bank 1 in one pcs. 72-pin SIMM sockets on board.

NOTE : SIMM 1 for single Bank DRAM module only, cannot support Double Bank DRAM. But can support FP DRAM & EDO DRAM at the same time.

DRAM BANK CONFIGURATION

SIMM 1 BANK 0, 1	TOTAL MEMORY
1M	1M
4M	4M
16M	16M

SOFTWARE UTILITIES

CHAPTER

3

This chapter comprises the detailed information of Flash BIOS Update and Watchdog function; also describes how to install the configurations.

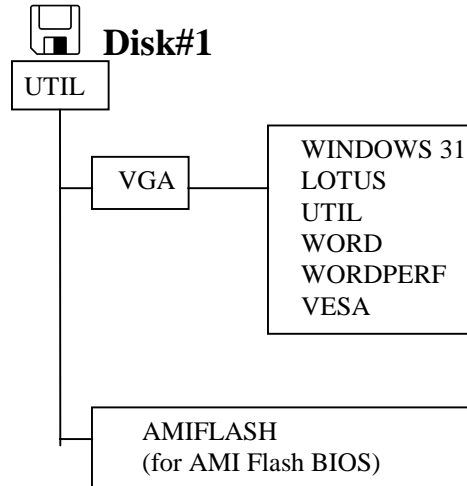
Sections include:

- VGA Configuration
- How to Install VGA Drivers for ISA
- Flash BIOS Update
- LAN Drivers Utilities
- Watchdog Timer Configuration

3-1. VGA CONFIGURATION

The VGA interface for PC-320 CPU Card can support a great range of displays, such as VGA, STN, TFT, EL ...etc. You can display CRT and LCD Panel simultaneously on this board, but make sure the modes for both displayed.

This card encloses with one Utility Disk. It contains two files: VGA.EXE and AMIFLASH.EXE. The architecture is as follow



Before you change any setup for VGA and system BIOS, you have to install your utility disk first, then the file will self-decompress and create sub-directory on your hard driver.

NOTE : No windows 95 VGA driver is installed in this Utility Disk. Users of PC-320 with Windows 95 system should update VGA display with the VGA program “Chip & Tech Super VGA”, which can be found inside Win95 system. More information on Win95 VGA installation is given in Section 3.2 “How to Install VGA Drivers for ISA”.

3-2. HOW TO INSTALL VGA DRIVERS FOR ISA

3-2-1. For Systems Win 3.1, Lotus/Symphony, VESA, Word 5.0/5.5, Wordperf, Utility Programs, etc...

Insert VGA Utility Disk to Drive A, and enter prompt path to
A:\UTIL\VGA\and type "setup".
A:\CD\UTIL\VGA\
A:\CD\UTIL\VGA\>SETUP

Press <Enter>, then the screen will display following tables:

DISPLAY DRIVER SETUP PROGRAM -Version 1.01 - (C) Copywriter 1992, 1994, Chips and Technologies, Inc.
DECOMPILATION OR DISASSEMBLY PROHIBITED Application Display Drivers for 655XX VGA Flat Panel/CRT Controllers Release 2.6.0 <<<Press any key to continue>>>

Follow the display messages to install VGA driver for CRT

Select any Application Driver to Install
Windows Version 3.1 Lotus / Symphony VESA Driver Version 1.2 Word Version 5.0 Word Version 5.5 WordPerfect Version 5.0 WordPerfect Version 5.1 Utility Programs
↑ ↓= Move cursor Up / Down, ENTER = Enter selection, ESC = exit to DOS

If you select “Windows Version 3.1”, the table below will appear on screen.

Windows Version 3.1	
All Resolutions	
↑↓ = Move cursor Up/Down ESC = Exit to Main Menu	Enter = Toggle selection END = Start to install

Press <Enter>; the “All Resolutions” will be selected, then press <End>; the table will change as follow:

Windows Version 3.1	
* All Resolutions	selected
Enter the [Drive : Path] for installation [C : \ WINDOWS]	

Please type the PATH name for installation. When you have completed all the installations as required, press any key to return to the Main Menu.

If you want to exit just press ESC, the message below will appear:

Do you really wan to exit (Y/N) ?

Select the answer as you require.

3-2-2. For Win95 System

No windows 95 VGA driver is included in this Utility Disk.

Users of PC-320 with Windows 95 system should update VGA display with the VGA program “Chip & Tech Super VGA”, which can be found inside Win95 system.

---To update VGA display to SVGA for Win95, user should enter its CONTROL panel, then DISPLAY, and then SETUP button.

---On SETUP screen, click DISPLAY PROPERTIES, then CHANGE DEVICES.

---On “Show all Devices” screen, pick “Chips & Technologies” for the “Chips & Tech Super VGA”. Click this line and update the VGA display.

3-3. FLASH BIOS UPDATE

You can use the AMIFLASH.EXE to update your system BIOS or VGA BIOS.

Change path to

C:\AMIFLASH>AMIFLASH

The screen will show as below:

American Megatrends	Flash EPROM Programming Utility Copyright (C) 1992-1997, AmericanMegatrends Inc. Ver.6.34 with 256Kb/Save BIOS support	Date:10/26/97
Enter File Name		
Message Enter the BIOS Filename from which Flash EPROM will be programmed. The Filename must end with a <Enter> or press <ESC> to exit.		Flash Information Flash Brand: Flash Type : Flash Size : File Size : Checksum : 00000h

Enter the new BIOS Filename: **A:\320B3AC1.ROM**; the screen will display the table below:

American Megatrends		Flash EPROM Programming Utility Copyright (C) 1992-1997, AmericanMegatrends Inc. Ver.6.34 with 256Kb/Save BIOS support Date:10/26/97	
Enter File Name			
A:\320B3AC1.ROM			
Message Flash EPROM Programming is to start. System will not be usable until programming of Flash EPROM is successfully complete. In case of any error, existing Flash EPROM must be replaced by new programmed Flash EPROM to make the system usable		Flash Information Flash Brand : SSY Flash Type : 29EE010 Flash Size : 128K Kb File Size : 128K bb Checksum : xxxxxh	
Press "Y" to continue, "N" to reboot			

If you want to save up the original BIOS, enter "Y" and press <Enter> the following table will be displayed. If you choose "N", the system will reboot itself.

American Megatrends		Flash EPROM Programming Utility Copyright (C) 1992-1997, AmericanMegatrends Inc. Ver.6.34 with 256Kb/Save BIOS support Date:10/26/97	
Enter File Name			
A:\320B3AC1.ROM			
Flash Update Completed - Pass			
Press any key to reboot			

3-4. LAN DRIVERS UTILITIES

3-4-1. Introduction of PC-320 LAN Drivers Utilities:

PC-320 LAN Drivers Utilities support the following operating systems:

1. MS LAN Manager v2.x
2. DECnet Path Work v4.x
3. WIN/TCP Path Way Access for DOS v1.x
4. 3COM 3+ Open v1.1
5. Banyan VINES v4.00(2)
6. IBM LAN Support Program v1.3.x
7. Windows for Workgroups v3.1/v3.5
8. IBM LAN Server v3.0
9. IBM Communication Manager v1.0
10. Artisoft LANtastic v6.0

3-4-2. Diskette# LAN Drivers & Utilities for PC-320 Users

PC-320 is a 386 embedded board, which is embedded with UMC UM9008F Controller to support various network adapters. Installation programs for LAN drivers are provided with PC-320 in a 1.44 diskette labelled Disk # LAN Drivers & Utilities:



LAN Utilities Disk

.....1. Mslanman	for Ethernet adapters
.....2. Ndis2	for Windows for Workgroups
.....3. Netware	for Netware
.....4. Win95	for Win95 LAN adapters
.....5. Workgroups	for WinNT v31/35 LAN adapters

Users installing network devices to PC-320 should also refer to the User's Manual provided by the device manufacturer or vender. System installed in PC-320 should also match the drivers provided in Utility Disk here.

3-5. WATCHDOG TIMER CONFIGURATION

The Watchdog Timer can reset the system automatically. It is defined at I/O port **443H**. When you want to enable the watchdog timer, please write I/O port **443H**, then the system will reset itself. When you want to disable the function, write I/O port **441H**, the system will run the command to stop the Watchdog function.

The PC-320 watchdog function : write I/O port address 443 to enable watchdog and write I/O port address 441 to disable watchdog. The timer's intervals have a tolerance of 25%, so you should program an introduction that will refresh the timer about every second.

The following program shows you how to program the watch timer in your program.

Watchdog enable program:

```
MOV AX, 000FH (choose the values you need; start from 0)
MOV DX, 443H
OUTDX, AX
```

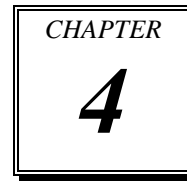
Watchdog disable program:

```
MOV AX, 000FH (please ignore this value)
MOV DX, 441H
OUTDX, AX
```

The Watchdog Timer control table is as follow:

Level	Value	Time/sec	Level	Value	Time/sec
1	F	0	9	7	64
2	E	8	10	6	72
3	D	16	11	5	80
4	C	24	12	4	88
5	B	32	13	3	96
6	A	40	14	2	104
7	9	48	15	1	112
8	8	56	16	0	120

AMI BIOS SETUP



This chapter states out how to set up the AMI BIOS.

Sections include:

- Introduction
- Run CMOS Setup
- The Standard CMOS Setup
- The Advanced CMOS Setup
- The Advanced Chipset Setup
- Peripheral Setup
- Change Supervisor Password
- Auto Configuration with Optimal Settings
- Auto Configuration with Fail Safe Settings
- Save Settings and Exit
- Exit Without Saving

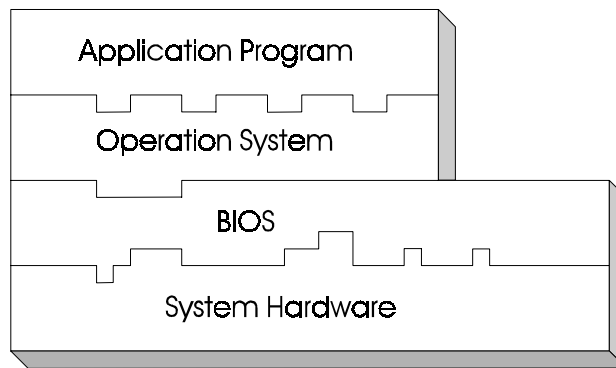
4-1. INTRODUCTION

This chapter will show you the function of a BIOS in managing the features of your system. The PC-320 Embedded Card is equipped with the BIOS for system chipset from AMI Software Inc. This page briefly explains the function of a BIOS in managing the special features of your system. The following pages describe how to use the BIOS for system chipset Setup menu.

Your application programs (such as word processing, spreadsheets, and games) rely on an operating system such as DOS or OS/2 to manage such things as keyboard, monitor, disk drives, and memory.

The operating system relies on a BIOS (Basic Input and Output system), a program stored on a ROM (Read-only Memory) chip, to initialize and configure your computer's hardware. As the interface between the hardware and the operating system, the BIOS enables you to make basic changes to your system's hardware without having to write a new operating system.

The following diagram illustrates the interlocking relationships between the system hardware, BIOS, operating system, and application program:



4-2 RUN CMOS SETUP

The SETUP programs lets you specify your system's configuration of diskette drivers, hard disk drivers, video display, memory, date, and time, and to make setting in the ALI chipset. The SETUP program can only be accessed when the CPU Card has been installed in your system and all necessary power, drive, and display connections have been made. When you turn on your computer, the system will run a memory check, and you can see it counting through the memory on your screen. The following display will also appear on your screen:

Hit < Del>, if you want to run SETUP

As long as this message is present on the screen you may press the < Del> key (the one that shares the decimal point at bottom of the number keypad) to access the setup program. In a moment, the main manu of the AMI SETUP program will appear on the screen:

AMIBIOS SETUP -- BIOS SETUP UTILITIES (C)1995 America Megatrends Inc., All Rights Reserved
Standard CMOS Setup Advanced CMOS Setup Advanced Chipset Setup Peripheral Setup Change User Password Change Supervisor Password Auto Configuration with Optimal Settings Auto Configuration with Fail Safe Settings Save Settings and Exit Exit Without Saving
Standard CMOS Setup for Change Time, Date, Hard Disk Type, etc ESC: Exit ↑←↓→: Sel F2/F3: Color F10: Save & Exit

You may use the cursor up/down keys to highlight the individual menu items. As you highlight each item, a brief description of that item's function appears in the lower window. If you have a color monitor you can use the F2 and F3 keys to scroll through the various color combinations available.

4-3 THE STANDARD CMOS SETUP MENU

The first item in the main menu is the **Standard CMOS Setup**. You must run this part of the setup program in order to correctly setup your hardware configuration. Highlight **Standard CMOS Setup** and press <ENTER>, the **Standard CMOS Setup** display which will appear on your screen, as shown on the following screen.

AMIBIOS SETUP PROGRAM--STANDARD CMOS SETUP										
(C)1995 American Megatrends Inc., All Right Reserved										
Date (mm/dd/yyyy) : Fri October 30, 1998										
Time (hh/mm/ss) : 14 : 14 : 06										
Floppy Drive A: 1.44MB 3½										
Floppy Drive B: Not Installed										
	Type	Size	Cyln	Head	WPcom	Sec	LBA Mode	Blk Mode	PIO Mode	32 Bit Mode
Pri Master	: Auto						On	On	Auto	Off
Pri Slave	: Auto						On	On	Auto	Off
Boot Sector Virus Protection Disabled										
Month:	Jan - Dec						ESC: Exit →↑↓← : Sel			
Day:	01 - 31						PgUp/PgDn : Modify			
Year:	1901-2099						F2/F3 : Color			

In the top right corner the base memory size and the extended memory size are displayed. This is automatically read from your systems, and you do not need to set these parameters. The bottom right hand of the screen shows a calendar. The month display depends on the date set in your system clock, and the current day flashes. Since you have not yet setup the time and date. The display is probably incorrect, correct them if necessary.

Information on each item and examples of setting.

DATE:

< Month >, < Date > and < Year >. Ranges for each value are listed below in prompt box in the lower left corner of the CMOS Setup Screen.

TIME:

< Hour >, < Minute >, and < Second >. Use 24 hour clock format, i.e., for PM numbers, add 12 to the hour. For examples, 4: 30P.M. You should enter the time as 16:30:00.

PRI MASTER / PRI SLAVE:

The categories identify the types of hard disk drive C or drive D that have been installed in the computer. There are 45 predefined types and 2 user definable types are for Normal BIOS. Type 1 or Type 45 are predefined. Type User is user-definable.

TYPE:

This is the number designation for a drive with certain identification parameters.

SIZE (CAPACITY):

This is the formatted capacity of the drive based on the following formula: (# of heads) X (# of cylinders) X (# of sets) X (512bytes/sects)

FLOPPY DRIVE A AND DRIVE B:

The option are 360KB 5.25in, 1.2KB 5.25in, 720KB 3.5in, 1.44MB 3.5in, 2.88MB 3.5in and None. Not Installed could be used as an option for diskless workstations.

BOOT SECTOR VIRUS PROTECTION:

Boot Sector virus Protection is an option in Advanced Setup. When enable, WinBIOS warns the user when any program attempts to write to or format the boot sector and allows the user to intervene. Options are disable and Enable.

After making all the above setting according to your system configuration. Press <ESC> to return to the main menu. If you do not

wish to use the advanced setup options you may now save the setting you made in the **Standard CMOS Setup** by pressing the F10 key or highlight the **Save Settings and Exit** item in the main menu. When you save the settings, your system will reboot and these settings will be automatically implemented every time you turn your computer on.

HARD DISK ATTRIBUTES:

Type	Cylinders	Heads	V-P comp	LZone	Sect	Capacity
1	306	4	128	305	17	10
2	615	4	300	615	17	20
3	615	6	300	615	17	30
4	940	8	512	940	17	62
5	940	6	512	940	17	46
6	615	4	65535	615	17	20
7	642	8	256	511	17	30
8	733	5	65535	733	17	30
9	900	15	65535	901	17	112
10	820	3	65535	820	17	20
11	855	5	65535	855	17	35
12	855	7	65535	855	17	49
13	306	8	128	319	17	20
14	733	7	65535	733	17	42
15	000	0	0000	000	00	00
16	612	4	0000	663	17	20
17	977	5	300	977	17	40
18	977	7	65535	977	17	56
19	1024	7	512	1023	17	59
20	733	5	300	732	17	30
21	733	7	300	732	17	42
22	733	5	300	733	17	30
23	306	4	0000	336	17	10
24	977	5	65535	976	17	40
25	1024	9	65535	1023	17	76
26	1224	7	65535	1223	17	71
27	1224	11	65535	1223	17	111
28	1224	15	65535	1223	17	152
29	1024	8	65535	1023	17	68
30	1024	11	65535	1023	17	93
31	918	11	65535	1023	17	83
32	925	9	65535	926	17	69
33	1024	10	65535	1023	17	85
34	1024	12	65535	1023	17	102
35	1024	13	65535	1023	17	110
36	1024	14	65535	1023	17	119
37	1024	2	65535	1023	17	17
38	1024	16	65535	1023	17	136
39	918	15	65535	1023	17	114
40	820	6	65535	820	17	40
41	1024	5	65535	1023	17	42
42	1024	5	65535	1023	26	65
43	809	6	65535	852	17	40
44	809	6	65535	852	26	61
45	776	8	65335	775	33	100
47			AUTO			

AMI Hard Disk Type Table

4-4 The ADVANCED CMOS SETUP

To access the Advanced CMOS Setup program, highlight **Advanced CMOS Setup** in the main menu and press < Enter >. A warning message will appear on your screen and you may press any key to remove this and access the Advanced CMOS setup program

BIOS SETUP PROGRAM--ADVANCED CMOS SETUP (C) 1995 American Megatrends Inc., All Rights Reserved		
1st Boot Device	: Floppy	Available Options: Disabled IDE-0 IDE-1 IDE-2 IDE-3 Floppy ARMD-FDD ARMD-HDD CDROM SCSI (SSD) NETWORK ESC : Exit ↑↓ : Sel. PgUp/PgDn: Modify F2/F3 : Color
2nd Boot Device	: IDE-0	
3rd Boot Device	: ARMD-HDD	
4th Boot Device	: Disabled	
Boot From Card Bios	: Yes	
Try Other Boot Devices	: Yes	
S.M.A.R.T. for Hard Disks	: Disabled	
BootUp Num-Lock	: On	
Floppy Drive Swap	: Disabled	
Floppy Drive Seek	: Enabled	
HDD Access Control	: Normal	
System Keyboard	: Present	
Primary Display	: VGA/EGA	
Password Check	: Setup	
System BIOS Cacheable	: Enabled	
C000, 32k Shadow	: Enabled	
C800, 32k Shadow	: Disabled	
D000, 32k Shadow	: Disabled	
D800, 32k Shadow	: Disabled	
E000, 32k Shadow	: Disabled	
E800, 32k Shadow	: Disabled	

The **Advanced CMOS Setup** allows you find true certain features supported by the chipset and AMI BIOS. It also includes support for shadow RAM under which the contents of the ROM BIOS can be copied into memory at boot up, enhancing performance. When you change any of the setting, you may recall the default settings at any time from the main menu. In order to see the available option, just highlight the relevant item and you will find the available options on the right side of the screen as shown on the screen above.

A brief introduction of each of the setting in the **Advanced CMOS Setup** program is given below.

1st/2nd/3rd/4th BOOT DEVICE:

These option sets the sequence of boot drives after AMIBIOS attempts to boot from after AMIBIOS POST completes. The default sequence settings are 1st boot device: floppy, 2nd boot device: IDE-0, 3rd boot device: ARMD-HDD, and 4th boot device: Disabled.

BOOT FROM CARD BIOS:

Set this option to "Yes" in order the BIOS to boot up having other option cards such as LAN, SCSI, etc...The settings are Yes and No. The default setting is Yes.

TRY OTHER BOOT DEVICES:

Set this option to "Yes" in order the BIOS to boot from other devices after all selected boot devices failed to boot. The settings are Yes and No. The default setting is Yes.

S.M.A.R.T. FOR HARD DISKS:

This option is set to support the S.M.A.R.T. Function. The settings are disabled or enabled. The Default setting is Disabled.

BOOTUP NUMLOCK:

Set this option to Off to turn the Num Lock key off when the computer is booted so you can use the arrow keys on both the numeric keypad and the keyboard. The settings are On or Off. The default setting is On.

FLOPPY DRIVE SWAP:

Set this option to Enabled to permit drives A: and B: to be swapped. The settings are Enabled or Disabled. The default setting is Disabled.

FLOPPY DRIVE SEEK:

When this option is set to Enabled, the BIOS performs a seek command on floppy drive A before booting the system. The settings are Enabled or Disabled. The default setting is Enabled.

HDD ACCESS CONTROL:

This option allows you to control the HDD from data writing. When the option is set to Read Only, the HDD cannot write any data. The settings are Normal or Read Only. The default setting is Normal.

SYSTEM KEYBOARD:

This option does not require a keyboard to be attached to the computer. Rather, it specifies if error messages are displayed if the keyboard is not attached. This option permits you to configure workstation with no keyboards. The settings are Absent or Present. The default setting is Present.

PRIMARY DISPLAY:

Select this option to configure the type of monitor attached to the computer. The settings are absent, VGA/EGA, CGA 40x25, CGA 80x25, or Mono. The default setting is VGA/EGA.

PASSWORD CHECK:

This option specifies the type of display monitor and adapter in the computer is powered on or every time AMIBIOS Setup is executed. If Always is chosen, a user password prompt appears every time the computer is turned on. If Setup is choosed, the password prompt appears is AMIBIOS is executed.

SYSTEM BIOS SHADOW CACHEABLE:

When this option is set to Enabled, the contents of the F0000h system memory segment can be read from or written to L2 secondary cache memory. The contents of the F0000h memory segment are always copied from the BIOS ROM to system RAM for faster execution.

The settings are Enabled and Disabled. The Optimal default setting is Enabled. The Fail-Safe default setting is Disabled.

C000, 32K SHADOW

C800, 32K SHADOW

D000, 32K SHADOW

D800, 32K SHADOW

E000, 32K SHADOW

E800, 32K SHADOW

These options control the location of the contents of the 32KB of ROM beginning at the specified memory location. If no adaptor ROM is using the named ROM area, the area is made available to the local bus. The settings are Setting, Description, Shadow. The contents of C0000h-C3FFFh are written to the same address in system memory (RAM) for faster execution.

4-5 THE ADVANCED CHIPSET SETUP

AMIBIOS SETUP --ADVANCED CHIPSET SETUP (C) 1995 American Megatrends Inc, All Rights Reserved		
Slow Refresh	: 120 us	Available Options: 15 us 120 us 60 us
Memory Hole At 15-16M	: Disabled	
RAS Precharge Time	: 1.5T	
RAS Active Time Insert Wait	: Disabled	
CAS Precharge Time Insert Wait	: Disabled	
Memory Write Insert Wait	: Disabled	
Memory Miss Read Insert Wait	: Disabled	
ISA Write Cycle end Insert Wait	: Disabled	
I/O Recovery	: Disabled	
I/O Recovery Period	: 0 us	
On-Chip I/O Recovery	: Disabled	
16 Bit ISA Insert Wait	: Disabled	

By moving cursor to the desired selection, all options for the desired selection will be displayed on right side of the screen for choice. User has to use select the desired option.

4-6 PERIPHERAL SETUP

Choose **Peripheral Setup** option on the main menu, a display will be shown on screen as below:

AMIBIOS SETUP - PERIPHERAL SETUP (C) 1995 American Megatrends Inc, All Rights Reserved		
Hard Disk Delay	: Disabled	Available Options: Disabled 3 Sec 5 Sec 10 Sec 15 Sec ESC : Exit ↓↑ : Sel PgUp/PgDn : Modify F2/F3 : Color
OnBoard IDE	: Enabled	
OnBoard FDC	: Enabled	
OnBoard Serial Port 1	: 3F8h	
OnBoard Serial Port 1 IRQ	: 4	
OnBoard Serial Port 2	: 2F8h	
OnBoard Serial Port 2 IRQ	: 3	
OnBoard Parallel Port	: 378	
Parallel Port Mode	: Normal	
EPP Version	: N/A	
Parallel Port IRQ	: 7	
Parallel Port DMA Channel	: N/A	

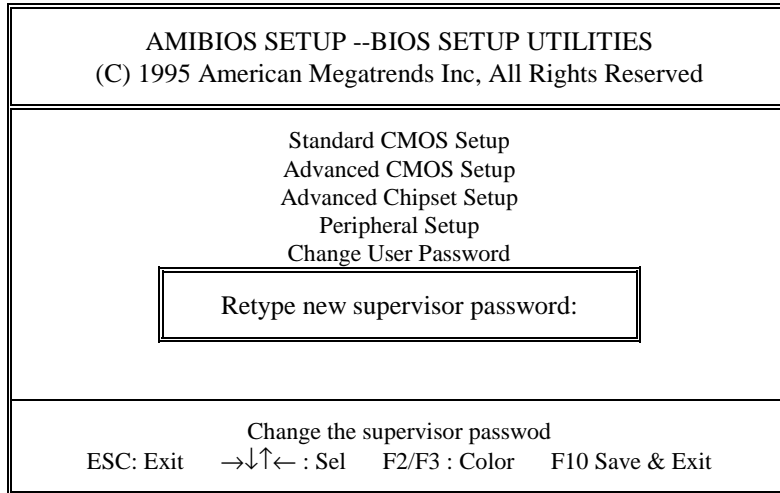
By moving cursor to the desired selection, all options for the desired selection will be displayed on the right side of the screen for choice. User has to use select the desired option.

4-7 CHANGE SUPERVISOR PASSWORD

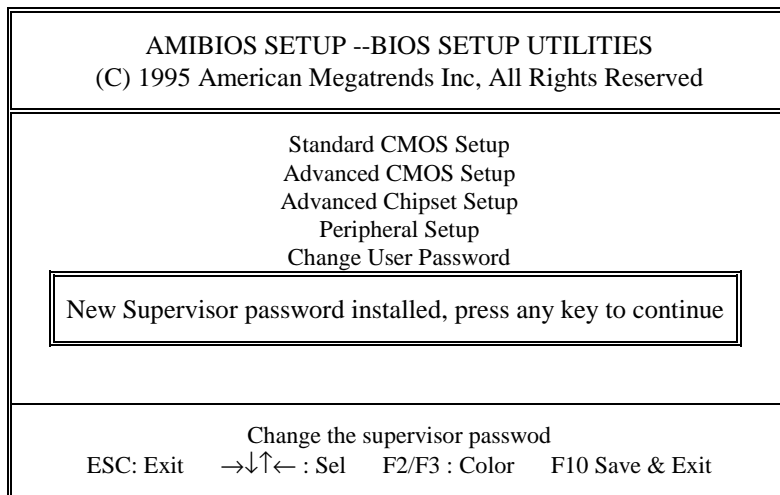
This main menu item to allow you to enable/disable the password checking option. Highlight the item and the display will be shown on screen as below:

AMIBIOS SETUP --BIOS SETUP UTILITIES (C) 1995 American Megatrends Inc, All Rights Reserved
Standard CMOS Setup Advanced CMOS Setup Advanced Chipset Setup Peripheral Setup Change User Password
Enter new supervisor password:
Change the supervisor passwod ESC: Exit →↓↑← : Sel F2/F3 : Color F10 Save & Exit

You may type in up to 8 characters for your password then press <Enter>. The screen will then ask you to verify the password as shown below:



And then this password will be stored in the CMOS.



4-8 AUTO CONFIGURATION WITH OPTIMAL SETTINGS

You can load the optimal default settings for the AMIBIOS Setup options by selecting the **Auto Configuration with Optimal Settings** from the Main Menu. The Optimal default are best-case values that should optimize system performance. If CMOS RAM is corrupted, the Optimal settings are loaded automatically.

AMIBIOS SETUP --BIOS SETUP UTILITIES (C) 1995 American Megatrends Inc, All Rights Reserved
Standard CMOS Setup Advanced CMOS Setup Advanced Chipset Setup Peripheral Setup Change User Password
Load high performance settings (Y/N) ? N
Load configuration settings giving highest performance ESC: Exit →↓↑← : Sel F2/F3 : Color F10 Save & Exit

4-9 AUTO CONFIGURATION W/ FAIL SAFE SETTINGS

Highlight the **Auto Configuration with Fail Safe Settings** option from Main Menu. The table below will be shown on screen.

AMIBIOS SETUP --BIOS SETUP UTILITIES (C) 1995 American Megatrends Inc, All Rights Reserved	
Standard CMOS Setup Advanced CMOS Setup Advanced Chipset Setup Peripheral Setup Change User Password	
Aut Auto	Load fail safe settings (Y/N) ? N
Load fail safe configuration settings ESC: Exit →↓↑← : Sel F2/F3 : Color F10 Save & Exit	

The Fail-Safe settings provide far from optimal system performance, but are the most stable settings. Use this option as a diagnostic aid if the system is behaving erratically.

4-10 SAVE SETTINGS AND EXIT

AMIBIOS SETUP --BIOS SETUP UTILITIES (C) 1995 American Megatrends Inc, All Rights Reserved
Standard CMOS Setup Advanced CMOS Setup Advanced Chipset Setup Peripheral Setup Change User Password
Save current settings and exit (Y/N) ? Y
Write the current settings to CMOS and exit ESC: Exit →↓↑← : Sel F2/F3 : Color F10 Save & Exit

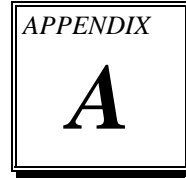
When you have completed adjusting all the settings as required, select the **Save Settings and Exit** item from Main Menu, the display will be shown on as above. Press “Y” when you wish to save the settings, your machine will be automatically rebooted and the changes you have made will be implemented. You may call up the setup program at any time to adjust any of the individual items by pressing key during boot up. If you wish to cancel any changes you have made, then press “N”, the original setting stored in the CMOS will be retained.

4-11 EXIT WITHOUT SAVING

When you have completed adjusting all the settings as required, and you do not want to save any changes. Highlight **Exit without Saving** and press “Y” the table below will be shown:

BIOS SETUP PROGRAM--BIOS SETUP UTILITIES (C) 1995 American Megatrends Inc, All Rights Reserved	
Standard CMOS Setup Advanced CMOS Setup Advanced Chipset Setup Peripheral Setup Change User Password	
Auto Auto	Quit without saving (Y/N) ?
Exit without saving the current settings ESC: Exit →↓↑← : Sel F2/F3 : Color F10 Save & Exit	

EXPANSION BUS



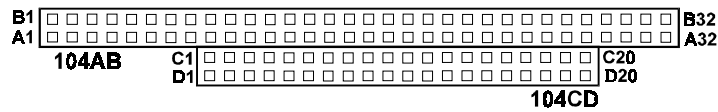
This appendix indicates you the pin assignments.

Sections include:

- PC-104 Connector Pin Assignment

PC-104 CONNECTOR PIN ASSIGNMENT

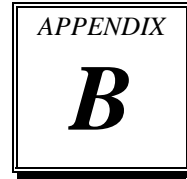
104AB, 104CD : PC-104 Connector



The PC-104 can support multi-pieces of PC-104 modules. This card has two connectors : one (104AB) consists of 64 pin, dual-in-line header, the other one (104CD) consists of 40 pin, dual-in-line header
The pin assignments for connector 104AB & 104CD are as follow:

104AB				104CD			
PIN	ASSIGNMENT	PIN	ASSIGNMENT	PIN	ASSIGNMENT	PIN	ASSIGNMENT
A1	IOCHK	B1	GND	C1	GND	D1	GND
A2	D7	B2	REST	C2	SBHE	D2	MEMCS16
A3	D6	B3	VCC	C3	LA23	D3	IOCS16
A4	D5	B4	IRQ9	C4	LA22	D4	IRQ10
A5	D4	B5	-5V	C5	LA21	D5	IRQ11
A6	D3	B6	DRQ2	C6	LA20	D6	IRQ12
A7	D2	B7	-12V	C7	LA19	D7	IRQ15
A8	D1	B8	OWS	C8	LA18	D8	IRQ14
A9	D0	B9	+12V	C9	LA17	D9	DACK0
A10	IOCHRDY	B10	GND	C10	MEMR	D10	DRQ0
A11	AEN	B11	SMEMW	C11	MEMW	D11	DACK5
A12	A19	B12	SMEMR	C12	D8	D12	DRQ5
A13	A18	B13	IOW	C13	D9	D13	DACK6
A14	A17	B14	IOR	C14	D10	D14	DRQ6
A15	A16	B15	DACK3	C15	D11	D15	DACK7
A16	A15	B16	DRQ3	C16	D12	D16	DRQ7
A17	A14	B17	DACK1	C17	D13	D17	VCC
A18	A13	B18	DRQ1	C18	D14	D18	MASTER
A19	A12	B19	REFRESH	C19	D15	D19	GND
A20	A11	B20	CLK	C20	KEY PIN	D20	GND
A21	A10	B21	IRQ7				
A22	A9	B22	IRQ6				
A23	A8	B23	IRQ5				
A24	A7	B24	IRQ4				
A25	A6	B25	IRQ3				
A26	A5	B26	DACK2				
A27	A4	B27	TC				
A28	A3	B28	BALE				
A29	A2	B29	VCC				
A30	A1	B30	OSC				
A31	A0	B31	GND				
A32	GND	B32	GND				

TECHNICAL SUMMARY



This section introduce you the maps concisely.

Sections include:

- Interrupt Map
- RTC & CMOS RAM Map
- Timer & DMA Channels Map
- I / O & Memory Map

INTERRUPT MAP

IRQ	ASSIGNMENT
0	System TIMER interrupt from TIMER-0
1	Keyboard output buffer full
2	Cascade for IRQ 8-15
3	Serial port 2
4	Serial port 1
5	Parallel port 1
6	Floppy Disk Adapter
7	Parallel port 2
8	RTC clock
9	VGA
10	Available
11	Available
12	Available
13	Reserved
14	Hard Disk Adapter
15	Available

RTC & CMOS RAM MAP

CODE	ASSIGNMENT
00	Seconds
01	Second alarm
02	Minutes
03	Minutes alarm
04	Hours
05	Hours alarm
06	Day of week
07	Day of month
08	Month
09	Year
0A	Status register A
0B	Status register B
0C	Status register C
0D	Status register D
0E	Diagnostic status byte
0F	Shutdown byte
10	Floppy Disk drive type byte
11	Reserve
12	Hard Disk type byte
13	Reserve
14	Equipment byte
15	Base memory low byte
16	Base memory high byte
17	Extension memory low byte
18	Extension memory high byte
30	Reserved for extension memory low byte
31	Reserved for extension memory high byte
32	Date Century byte
33	Information Flag
34-3F	Reserve
40-7f	Reserved for Chipset Setting Data

TIMER & DMA CHANNELS MAP

Timer Channel Map :

Timer Channel	Assignment
0	System timer interrupt
1	DRAM Refresh request
2	Speaker tone generator

DMA Channel Map :

DMA Channel	Assignment
0	Available
1	IBM SDLC
2	Floppy Disk adapter
3	Channel-3 Available
4	Cascade for DMA controller 1
5	Available
6	Available
7	Available

I/O & MEMORY MAP

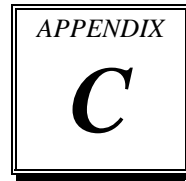
Memory Map :

MEMORY MAP	ASSIGNMENT
0000000-009FFFF	System memory used by DOS and application
00A0000-00BFFFF	Display buffer memory for VGA/ EGA / CGA / MONOCHROME adapter
00C0000-00DFFFF	Reserved for I/O device BIOS ROM or RAM buffer.
00E0000-00EFFFF	Reserved
00F0000-00FFFFFF	System BIOS ROM
0100000-BFFFFFFF	System extension memory

I/O Map :

I/O MAP	ASSIGNMENT
000-01F	DMA controller (Master)
020-021	Interrupt controller (Master)
022-023	Chipset controller registers I/O ports.
040-05F	Timer control registers.
060-06F	Keyboard interface controller (8042)
070-07F	RTC ports & CMOS I/O ports
080-09F	DMA register
0A0-0BF	Interrupt controller (Slave)
0C0-0DF	DMA controller (Slave)
0F0-0FF	Math coprocessor
1F0-1F8	Hard Disk controller
278-27F	Parallel port-2
2B0-2DF	Graphics adapter controller
2F8-2FF	Serial port-2
360-36F	Net work ports
378-37F	Parallel port-1
3B0-3BF	Monochrome & Printer adapter
3C0-3CF	EGA adapter
3D0-3DF	CGA adapter
3F0-3F7	Floppy disk controller
3F8-3FF	Serial port-1

TROUBLE SHOOTING



This section outlines the errors may occur when you operate the system, also gives you the suggestions on solving the problems.

Sections include:

- Trouble Shooting for System Error Messages
- AMIBIOS Displayed Error Messages
- Trouble Shooting for POST Codes

TROUBLE SHOOTING FOR SYSTEM ERROR MESSAGE

The following information inform you the error messages and the trouble shooting. Please adjust your systems according to the messages below. And make sure all the components and connectors are in proper position and firmly attached. If the errors still encountered, please contact with your distributor for maintenance.

BEEP 1: REFRESH FAILURE

The memory refresh circuitry is faulty. Reseat the memory SIMMs or DIPs. If the system still beeps, replace the memory.

BEEP 2: PARITY ERROR

Parity error in the base memory (the first 64 KB block) of memory. Reset the memory SIMMs or DIPs. If the system still beeps, replace the memory.

BEEP 3: BASE 64 KB Memory Failure

Memory failure in the first 64 KB. Reset the memory SIMMs or DIPs. If the system still beeps, replace the memory.

BEEP 4: TIMER NOT OPERATIONAL

A memory failure in the first 64 KB of memory, or Timer 1 is not functioning. The CPU Card must be replaced.

BEEP 5: PROCESSOR ERROR:

Faulty CPU. The CPU must be replaced.

BEEP 6: 8042-Gate A20 Failure:

Cannot switch to Protected Mode. Reset the keyboard controller chip. If it still beeps, replace the keyboard controller. If it still beeps, try a different keyboard, or replace the keyboard fuse, if the keyboard has one.

BEEP 7: PROCESSOR EXCEPTION INTERRUPT ERROR

Exception interrupt found in CPU. The CPU must be replaced.

BEEP 8: DISPLAY MEMORY READ/WRITE ERROR

The system video adapter is either missing or its memory is faulty. This is not a fatal error. There is a memory error on the video adapter. Replace the video adapter, or the RAM on the video adapter.

BEEP 9: ROM CHECKSUM ERROR

The ROM checksum values does not match the value encoded in the AMIBIOS. The BIOS ROM probably is bad. The system probably needs a new BIOS ROM chip.

BEEP 10: CMOS SHUTDOWN REGISTER READ/WRITE ERROR

When the situation happens, the CPU Card must be replaced.

BEEP 11: CACHE MEMORY BAD - DO NOT ENABLE CACHE

When this situation happens, it shows that the cache memory test failed. Cache memory is disabled. *Do not press <Ctrl> <Alt> <Shift> <+> to enable cache memory.* Reset the cache memory on the motherboard. If it still beeps, replace the cache memory.

AMIBIOS DISPLAYED ERROR MESSAGES

ADDRESS LINE SHORT :

Error in the address decoding circuitry.

C: DRIVE ERROR :

No response from drive C:. Run the AMIDiag Hard Disk Utility. Check the C: hard disk type in Standard Setup.

C: DRIVE FAILURE :

No response from hard disk drive C:. Replace the drive.

CACHE MEMORY BAD :

Do not enable Cache! Cache memory is defective. Run AMIDiag.

CH-2 TIMER ERROR :

An AT system has two timers. There is an error in timer2.

CMOS BATTERY STATE LOW :

CMOS RAM is powered by a battery. The battery power is low. Replace the battery.

CMOS CHECKSUM FAILSURE :

CMOS RAM checksum is different than the previous value. Run AMIBIOS Setup.

CMOS SYSTEM OPTIONS NOT SET :

The values stored in CMOS RAM are either corrupt or nonexistent. Run AMIBIOS Setup.

CMOS DISPLAY TYPE MISMATCH :

The video type in CMOS RAM does not match the type detected. Run AMIBIOS Setup.

CMOS MEMORY SIZE MISMATCH :

The amount of memory found by AMIBIOS is different from the amount in CMOS RAM. Run AMIBIOS Setup.

CMOS TIME AND DATE NOT SET :

Run Standard Setup to set the date and time.

D: DRIVE ERROR :

No response from drive D:. Run the AMIDIag Hard Disk Utility. Check the hard disk type in Standard Setup.

D: DRIVE FAILURE :

No response from hard disk drive D:. Replace the drive.

DISKETTE BOOT FAILURE :

The boot diskette in drive A: cannot be used to boot the system. Use another boot diskette and follow the screen instructions.

DISPLAY SWITCH NOT PROPER :

Some systems require a video switch be set to either color or monochrome. Turn the system off, set the switch properly, then power on.

DMA ERROR :

Error in the DMA controller.

DMA1 ERROR :

Error in the first DMA channel.

DMA2 ERROR :

Error in the second DMA channel.

FDD CONTROLLER FAILURE :

AMIBIOS cannot communicate with the floppy disk drive controller.
Check all appropriate connections after the system is powered down.

HDD CONTROLLER FAILURE :

AMIBIOS cannot communicate with the hard disk drive controller.
Check all appropriate connections after the system is powered down.

INTR1 ERROR :

Interrupt channel 1 failed POST.

INTR2 ERROR :

Interrupt channel 2 failed POST.

INVALID BOOT DISKETTE :

AMIBIOS can read the diskette in floppy drive A:, but it cannot boot the system with it. Use another boot diskette and follow the screen instructions.

KEYBOARD IS LOCKED.....UNLOCK IT :

The keyboard lock on the system is engaged. The system must be unlocked to continue to boot.

KEYBOARD ERROR :

The keyboard has a timing problem. Make sure a Keyboard Controller AMIBIOS is installed. Set Keyboard in Advanced Setup to "Not Installed" to skip the keyboard POST routines.

KB/INTERFACE ERROR :

There is an error in the keyboard connector.

NO ROM BASIC :

Cannot find a proper bootable sector on either drive A: or C:. AMIBIOS cannot find ROM Basic.

OFF BOARD PARITY ERROR :

Parity error in memory installed on an adapter card in an expansion slot.

The format is:

OFF BOARD PARITY ERROR ADDR = (xxxx)

XXXX is the hex address where the error occurred. Run AMIDiag to find and correct memory problems.

ON BOARD PARITY ERROR :

Parity error in motherboard memory. The format is:

ON BOARD PARITY ERROR ADDR = (xxxx)

XXXX is the hex address where the error occurred. Run AMIDiag to find and correct memory problems.

PARITY ERROR ?????

Parity error in system memory at an unknown address. Run AMIDiag to find and correct memory problems.

MEMORY PARITY ERROR AT xxxxx :

Memory failed. If the memory location can be determined, it is displayed as xxxxx. If not, the message is *Memory Parity Error?????*

I/O CARD PARITY ERROR AT xxxxx :

An expansion card failed. If the address can be determined, it is displayed as xxxxx. If not, the message is *I/O Card Parity?????*

DMA BUS TIME-OUT :

A device has driven the bus signal for more than 7.8 microseconds.

TROUBLE SHOOTING FOR POST CODES

When you power on your PC, and the screen display nothing. You have to insert the POST Card for test. The address for ISA POST port is 80h. Make sure the card is in correct slot. The lists below indicates the error messages, please follow the instruction to adjust your system. If the error still occurred, please contact your distributor for maintenance.

UNCOMPRESSED INIT CODE CHECKPOINTS

- D0 :** NMI is Disabled. CPU ID saved.
- D1 :** To do DMA init, Keyboard controller BAT test, start memory refresh and going to 4GB flat mode.
- D3 :** To start Memory sizing.
- D4 :** To comeback to real mode. Execute OEM patch. Set stack.
- D5 :** E000 ROM enabled. Init code is copied to segment 0 and control to be transferred to segment 0.
- D6 :** Control is in segment 0. To check <CTRL> <HOME> key and verify main BIOS checksum.
If either <CTRL> <HOME> is pressed or main BIOS checksum is bad, go to check point E0, or else go to check point D7.
- D7 :** Main BIOS runtime code is to be decompressed and control to be passed to main BIOS in shadow RAM.

BOOT BLOCK RECOVERY CODE CHECK POINTS

- E0 :** OnBoard Floppy Controller (if any) is initialized.
To start base 512K memory test.
- E1 :** To initialize interrupt vector table.
- E2 :** To initialize DMA and interrupt controllers.
- E6 :** To enable floppy and timer IRQ, enable internal cache.

- ED :** Initialize floppy drive.
- EE :** Start looking for a diskette in drive A: and read 1st sector of the diskette.
- EF :** Floppy read error.
- F0 :** Start searching “AMIBOOT.ROM” file in root directory.
- F1 :** “AMIBOOT.ROM” file not present in root directory.
- F2 :** Start reading FAT table and analyze FAT to find the clusters occupied by “AMIBOOT.ROM” file.
- F3 :** Start reading “AMIBOOT.ROM” file cluster by cluster.
- F4 :** “AMIBOOT.ROM” file not of proper size.
- F5 :** Disable internal cache.
- FB :** Detect Flash type present.
- FC :** Erase Flash.
- FD :** Program Flash.
- FF :** Flash program successful. BIOS is going to restart.

RUNTIME CODE IS UNCOMPRESSED IN F000 SHADOW RAM

- 03 :** NMI is Disabled. To check soft reset/power-on.
- 05 :** BIOS stack set. Going to disable Cache if any.
- 06 :** POST code to be uncompressed.
- 07 :** CPU init and CPU data area init to be done.
- 08 :** CMOS checksum calculation to be done next.

- 0B :** Any initialization before keyboard BAT to be done next.
- 0C :** KB controller I/B free. To issue the BAT command to keyboard controller.
- 0E :** Any initialization after KB controller BAT to be done next.
- 0F :** Keyboard command byte to be written.
- 10 :** Going to issue Pin-23, 24 blocking/unblocking command.
- 11 :** Going to check pressing of <INS>, <END> key during power-on.
- 12 :** To init CMOS if “Init CMOS in every boot” is set or <END> key is pressed. Going to disable DMA and Interrupt controllers.
- 13 :** Video display is disabled and port-B is initialized. Chipset init about to begin.
- 14 :** 8254 timer test about to start.
- 19 :** About to start memory refresh test.
- 1A :** Memory Refresh line is toggling. Going to check 15us ON/OFF time.
- 23 :** To read 8042 input port and disable MegaKey GreenPC feature. Make BIOS code segment writeable.
- 24 :** To do any setup before Int vector init.
- 25 :** Interrupt vector initialization about to begin. To clear password if necessary.
- 27 :** Any initialization before setting video mode to be done.
- 28 :** Going for monochrome mode and color mode setting.
- 2A :** Different BUSES init (system, static, output devices) to start if present. *(Please see Appendix for details of different BUSES).*

- 2B :** To give control for any setup required before optional video ROM check.
- 2C :** To look for optional video ROM and give control.
- 2D :** To give control to do any processing after video ROM returns control.
- 2E :** If EGA/VGA not found then do display memory R/W test.
- 2F :** EGA/VGA not found. Display memory R/W test about to begin.
- 30 :** Display memory R/W test passed. About to look for the retrace checking.
- 31 :** Display memory R/W test or retrace checking failed. To do alternate Display memory R/W test.
- 32 :** Alternate Display memory R/W test passed. To look for the alternate display retrace checking.
- 34 :** Video display checking over. Display mode to be set next.
- 37 :** Display mode set. Going to display the power on message.
- 38 :** Different BUSES init (input, IPL, general devices) to start if present. *(Please see Appendix for details of different BUSES).*
- 39 :** Display different BUSES initialization error messages. *(Please see Appendix for details of different BUSES).*
- 3A :** New cursor position read and saved. To display the Hit message.
- 40 :** To prepare the descriptor.
- 42 :** To enter in virtual mode for memory test.
- 43 :** To enable interrupts for diagnostics mode.
- 44 :** To initialize data to check memory wrap around at 0:0.

- 45 :** Data initialized. Going to check for memory wrap around at 0:0. And finding the total system memory size.
- 46 :** Memory wrap around test done. Memory size calculation over. About to go for writing patterns to test memory.
- 47 :** Pattern to be tested written in extended memory. Going to write patterns in base 640k memory.
- 48 :** Patterns written in base memory. Going to findout amount of memory below 1M memory.
- 49 :** Amount of memory below 1M found and verified. Going to findout amount of memory above 1M memory.
- 4B :** Amount of memory above 1M found and verified. Check for soft reset and going to clear memory below 1M for soft reset. (If power on, go to check point #4Eh).
- 4C :** Memory below 1M cleared. (SOFT RESET) Going to clear memory above 1M.
- 4D :** Memory above 1M cleared. (SOFT RESET). Going to save the memory size. (Goto check point # 52h).
- 4E :** Memory test started. (NOT SOFT RESET). About to display the first 64k memory size.
- 4F :** Memory size display started. This will be updated during memory test. Going for sequential and random memory test.
- 50 :** Memory testing/initialization below 1M complete. Going to adjust displayed memory size for relocation/shadow.
- 51 :** Memory size display adjusted due to relocation/shadow. Memory test above 1M to follow.
- 52 :** Memory testing/initialization above 1M complete. Going to save memory size information.

- 53 :** Memory size information is saved. CPU registers are saved.
Going to enter in real mode.
- 54 :** Shutdown successful, CPU in real mode. Going to disable gate A20
line and disable parity/NMI.
- 57 :** A20 address line, parity/NMI disable successful.
Going to adjust memory size depending on relocation/shadow.
- 58 :** Memory size adjusted for relocation/shadow.
Going to clear Hit message.
- 59 :** Hit message cleared. <WAIT...> message displayed.
About to start DMA and interrupt controller test.
- 60 :** DMA page register test passed. To do DMA#1 base register test.
- 62 :** DMA#1 base register test passed. To do DMA#2 base register test.
- 65 :** DMA#2 base register test passed. To program DMA unit 1 and 2.
- 66 :** DMA unit 1 and 2 programming over.
To initialize 8259 interrupt controller.
- 7F :** Extended NMI sources enabling is in progress.
- 80 :** Keyboard test started. Clearing output buffer, checking for stuck key,
to issue keyboard reset command.
- 81 :** Keyboard reset error/stuck key found. To issue keyboard controller
interface test command.
- 82 :** Keyboard controller interface test over. To write command byte and
init circular buffer.
- 83 :** Command byte written, Global data init done. To check for lock-key.
- 84 :** Lock-key checking over. To check for memory size mismatch with
CMOS.

- 85 :** Memory size check done. To display soft error and check for password or bypass setup.
- 86 :** Password checked. About to do programming before setup.
- 87 :** Programming before setup complete. To uncompress SETUP code and execute CMOS setup.
- 88 :** Returned from CMOS setup program and screen is cleared. About to do programming after setup.
- 89 :** Programming after setup complete.
- 8B :** First screen message displayed. <WAIT...> message displayed. PS/2 Mouse check and extended BIOS data area allocation to be done.
- 8C :** Setup options programming after CMOS setup about to start.
- 8D :** Going for hard disk controller reset.
- 8F :** Hard disk controller reset done. Floppy setup to be done next.

- 91 :** Floppy setup complete. Hard disk setup to be done next.
- 95 :** Init of different BUSes optional ROMs from C800 to start.
- 96 :** Going to do any init before C800 optional ROM control.
- 97 :** Any init before C800 optional ROM control is over. Optional ROM check and control will be done next.
- 98 :** Optional ROM control is done. About to give control to do any required processing after optional ROM returns control and enable external cache.
- 99 :** Any initialization required after optional ROM test over.

- 9A :** Return after setting timer and printer base address.
Going to set the RS-232 base address.
- 9B :** Returned after RS-232 base address.
Going to do any initialization before Coprocessor test.
- 9C :** Required initialization before Coprocessor is over.
Going to initialize the Coprocessor next.
- 9D :** Coprocessor initialized.
Going to do any initialization after Coprocessor test.
- 9E :** Initialization after Coprocessor test is complete. Going to check
extend keyboard, keyboard ID and num-lock. Keyboard ID command
to be.
- A2 :** Going to display any soft errors.
- A3 :** Soft error display complete. Going to set keyboard typematic rate.
- A4 :** Keyboard typematic rate set. To program memory wait states.
- A5 :** Going to enable parity/NMI.
- A7 :** NMI and parity enabled. Going to do any initialization required
before giving control to optional ROM at E000.
- A8 :** Initialization before E000 ROM control over.
E000 ROM to get control next.
- A9 :** Returned from E000 ROM control. Going to do any initialization
required after E000 optional ROM control.
- AA :** Initialization after E000 optional ROM control is over.
Going to display the system configuration.
- AB :** To uncompress DMI data and execute DMI POST init.
- B0 :** System configuration is displayed.

B1 : Going to copy and code to specific done.

00 : Copying of code to specific area done.
Going to give control to INT-19 boot loader.

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