USER′S MANUAL

PC-560

586/6x86
Half-sized Embedded Card
W/ VGA & Flat Panel

PC-560-M3

PC-560 PENTIUM EMBEDDED CPU CARDWITH VGA

OPERATION MANUAL

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CHAPTER 1

INTRODUCTION

This chapter gives you the information for PC-560. It also outlines the System specification.

Sections include:

- About This Manual
- System Specifications
- Safety precautions

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

1-1. ABOUT THIS MANUAL

Thank you for purchasing our PC-560 Pentium Embedded CPU Card with VGA, fully PC / AT compatible. The PC-560 provides faster processing speed, greater expandability and can handle more task than before. This manual is designed to assist you how to install and set up the system. It contents five 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 indicate you how to avoid the damages for this Embedded CPU Card.

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 card to meet your own needs.

Chapter 3 Software Utilities

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

Chapter 4 Green PC Function

This chapter explains the Green PC functions concisely.

Chapter 5 Award BIOS Setup

This chapter indicates you how to set up the BIOS configurations.

Appendix A Expansion Bus

This Appendix introduces you the expansion bus for PC-104 and ISA BUS

Appendix B Technical Summary

This section gives you the information about the Technical maps.

Appendix C Trouble Shooting

This section outlines the errors and offers you the methods to solve the problems.

1-2. SYSTEM SPECIFICATION

- **CPU :**
  Intel, AMD, Cyrix.
  54C/55C/6x86.
  321pin PGA socket.
  75/90/100/120/133/166/200MHz clock generator.
  2.5V/2.75V, 3.3V/3.52V voltage regulator.

- **MEMORY :**
  Up to 128MB, EDO/FPM DRAM
  Two 72pin SIMM socket on board.

- **CACHE :**
  L1 Cache (depended on CPU type).
  L2 Cache 256/512K.

- **REAL-TIME CLOCK / CALENDAR :**
  CMOS data back up from BIOS set or BIOS default.
  Dallas DS 12887 Real Time Clock.

- **BIOS :**
  Award, Flash BIOS for plug & play function.
  Easy update 128KB flash EEPROM.
  Support Green Function .
  Support S/IO Setup.

- **KEYBOARD CONNECTOR :**
  PC/AT type mini DIN connector.
  Support PC/AT Keyboard or PS/2 Mouse by jumper selection.
  5 pin External keyboard connector.

- **BUS SUPPORT :**
  External ISA BUS.
  Internal PCI Bus, for VGA & IDE.
  PC-104 BUS.

- **DISPLAY :**
  Support SVGA for CRT & Panel.
  Support 32bits PCI Local Bus.
  VGA BIOS combines in 128KB flash ROM together with system BIOS.
  Support 15 pin connector 1024 x 768 (256 colors) resolution on SVGA Monitor.
  Support 1 MB Video memory.
  Support 41 pin connector 640 x 480 or 800 x 600 resolutions on LCD Panel.
  Panel support mono, color STN, TFT, EL.
  SVGA & Panel Display simultaneously.

- **WATCHDOG :**
  I / O port 443H to open watchdog.
  I / O port 441H to close watchdog.
  Time-out timing select 0 / 2 / 4 / 6 / 8 / 10 / 12 / 14 / 16 / 18 / 20 / 22 / 24 / 26 / 28 / 30 sec +/- 25%.

- **IDE INTERFACE :**
  One IDE port, Support up to four Enhanced IDE devices; optional.

- **FLOPPY DISK DRIVER 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.
  MIDI Compatible.
  Programmable Baud Rate Generator.

- **PARALLEL PORT :**
  SPP, ECP, EPP Function.
  Bi-direction parallel port.

- **GREEN FUNCTION :**
  Software support by BIOS setup.
  Hardware support by switch control.

- **LED INDICATOR :**
  System power.
  Hard Disk access.
  Turbo and green function mode.

- **PC-104 BUS EXPANSION & SPEED :**
  ISA 8MHz
  PC-104 8MHz
  PCI Bus 33MHz

- **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.

- **BOARD DIMENSION :**
  7.2"(L) x 4.8"(W) (185mm x 122mm)

- **BOARD WEIGHT :**
  0.25 Kg.

1-3. SAFETY PRECAUTIONS

Follow the messages below to avoid your systems from damage:

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.

CHAPTER

2

HARDWARE CONFIGURATION

*** QUICK START ***

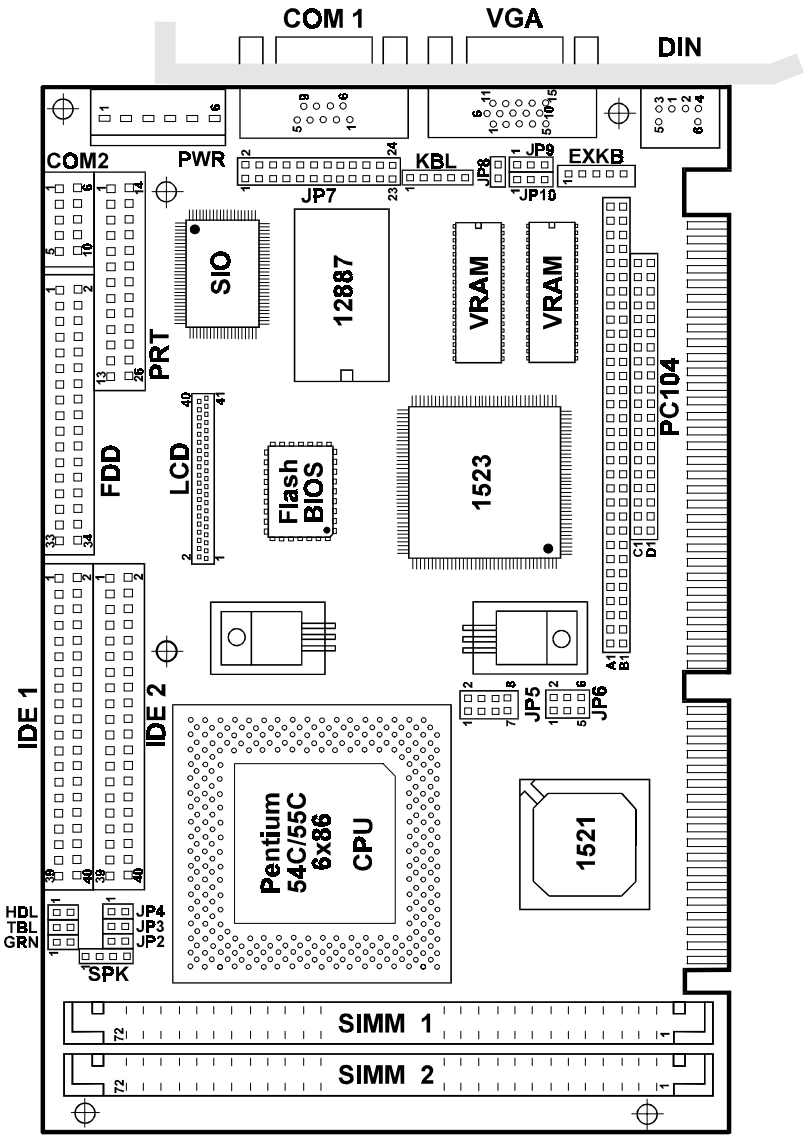
Helpful information details you the jumper & connector settings, and components locations.

Sections include:

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

2-1 JUMPER & CONNECTOR QUICK REFERENCE TABLE

2-2 COMPONENT LOCATIONS



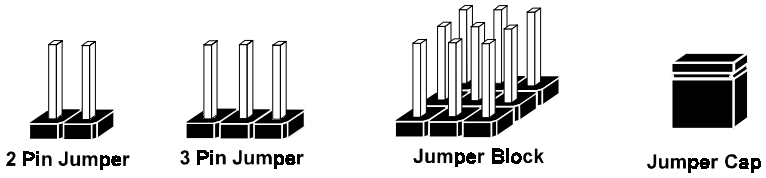
PC-560 Connector ,Jumper and Component locations

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.

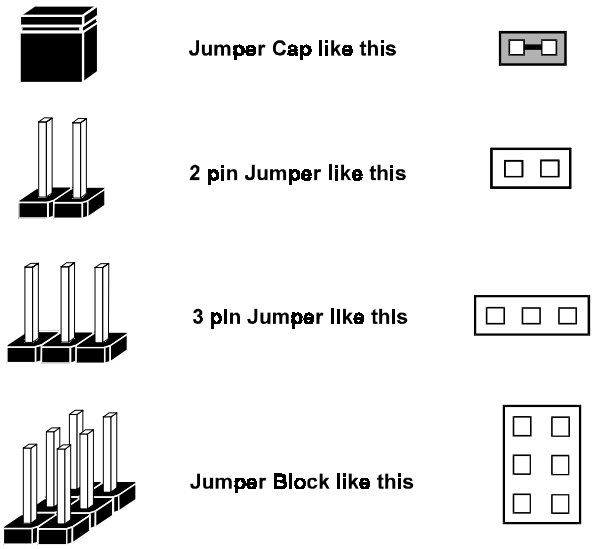
The jumper can be combined into sets which called jumper blocks. When the jumpers are all in the block, you have to put them together to set up the hardware configuration. The figure below shows how this looks.

JUMPERS AND CAPS

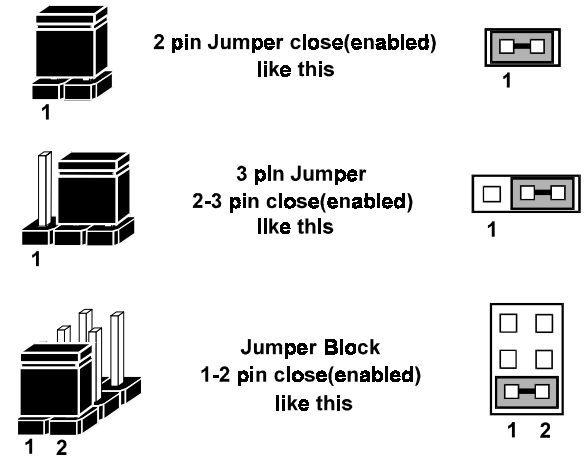


If a jumper has three pins, for examples, labelled PIN1, PIN2, and PIN3. You can connect PIN1 & PIN2 to create one setting and shorting. You can either connect PIN2 & PIN3 to create another setting. The same jumper diagrams are applied all through this manual. The figure below shows what the manual diagrams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

JUMPER DIAGRAMS



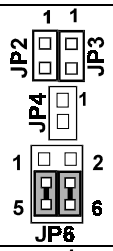
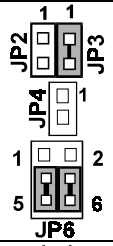
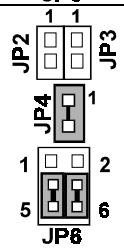
JUMPER SETTINGS



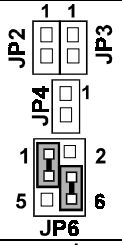
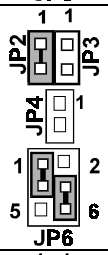
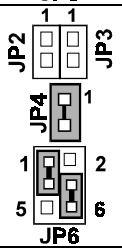
2-4 CPU TYPE & CPU CLOCK SELECTION

JP2, JP3 : Bus Frequency Ratio Selection
JP4 : CPU Type Selection
JP6 : CPU Clock Selection
The jumper settings are as follow :

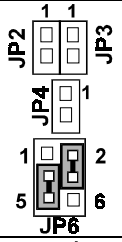
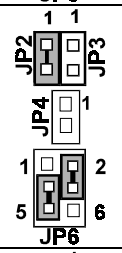
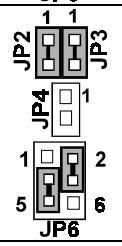
2-4-1 Intel 75/150, Cyrix P-120+, CPU type & Clock Jumper Setting

CPU TYPE	CPU CLOCK	Jumper setting (Pin closed) JP2	JP3	JP4	JP6	Jumper Illustration
Intel Pentium 75Mhz	50MHz	open	open	open	3-5 4-6	
Intel Pentium 150Mhz	50Mhz	open	closed	open	3-5 4-6	
Cyrix 6x86/ P-120+	50Mhz	open	open	closed	3-5 4-6	

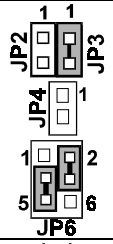
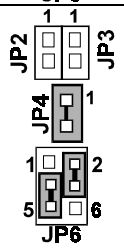
2-4-2 Intel 90/120, Cyrix P-150+, CPU type & clock Jumper Setting

CPU TYPE	CPU CLOCK	Jumper setting (Pin closed) JP2	JP3	JP4	JP6	Jumper Illustration
Intel Pentium 90Mhz	60MHz	open	open	open	1-3 4-6	
Intel Pentium 120Mhz	60Mhz	closed	open	open	1-3 4-6	
Cyrix 6x86/ P-150+	60Mhz	open	open	closed	1-3 4-6	

2-4-3 Intel 100/133/166 CPU type & clock Jumper Setting

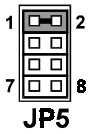
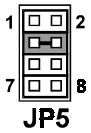
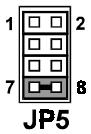
CPU TYPE	CPU CLOCK	Jumper setting (Pin closed) JP2	JP3	JP4	JP6	Jumper Illustration
Intel Pentium 100Mhz	66MHz	open	open	open	2-4 3-5	
Intel Pentium 133Mhz	66Mhz	closed	open	open	2-4 3-5	
Intel Pentium 166Mhz	66Mhz	closed	closed	open	2-4 3-5	

2-4-4 Intel 200, Cyrix P-166+ CPU type & clock Jumper Setting

CPU TYPE	CPU CLOCK	Jumper setting (Pin closed) JP2	JP3	JP4	JP6	Jumper Illustration
Intel Pentium 200Mhz	66Mhz	open	closed	open	2-4 3-5	
Cyrix 6x86/ P-166+	66Mhz	open	open	closed	2-4 3-5	

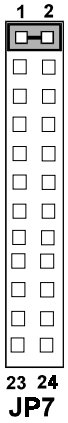
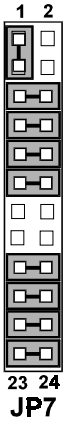
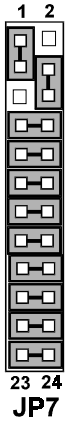
2-5 CPU VOLTAGE SELECTION

JP5: CPU Voltage Selection.
The end-user can select the CPU voltage by adjusting the jumpers. The jumper settings are as follow:

CPU Type	CPU Voltage	Jumper Setting (Pin Closed)	Jumper Illustration
Intel Pentium 75/90/100/120/133/ 150/166 Cyrix 6x86/P-120+/P-150+/ P-166+	3.3V	1-2	
Cyrix 6x86/P-120+/P-150+/ P-166+	3.52V	3-4	
Intel Pentium MMX 166/200	2.75V	7-8	

2-6 RS232/422/485 (COM2) SELECTION

JP7 : RS-232/422/485 Selection
COM1 is fixed for RS-232 function only.
COM2 is selectable for RS422, 485 function
The jumper settings are as follow :

COM 2 Function	**RS-232**	**RS-422**	**RS-485**
Jumper setting (pin closed)	1-2	1-3 5-6 7-8 9-10 11-12 17-18 19-20 21-22 23-24	1-3 4-6 7-8 9-10 11-12 13-14 15-16 17-18 19-20 21-22 23-24
Jumper illustration			

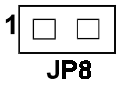
*** Manufactory default --- RS-232.

`

2-7 RESET CONNECTOR

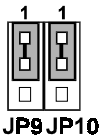
JP8 : Reset Connector
The pin assignments are as follow :

PIN	ASSIGNMENT
1	Reset
2	Ground



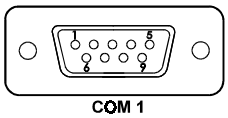
2-8 AT KEYBOARD / PS2 MOUSE SELECTION

JP9, JP10 : AT Keyboard / PS2 Mouse Selection
The jumper settings are as follow:

KEYBOARD TYPE	JUMPER SETTING (pin closed) JP9	JP10	JUMPER ILLUSTRATION
AT KEYBOARD	2-3	2-3	
PS/2 MOUSE	1-2	1-2	

2-9 COM1 CONNECTOR

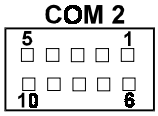
COM1 : COM1 Connector, DB9 male connector
The COM1 Connector assignments are as follow :



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

2-10 COM2 CONNECTOR

COM2 : COM2 Connector
The COM2 Connector assignments are as follow :

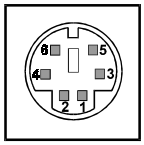


PIN	ASSIGNMENT		
	RS-232	RS-422	RS-485
1	DCD	TX-	DATA-
2	RX	TX+	DATA+
3	TX	RX+	NC
4	DTR	RX-	NC
5	GND	GND	GND
6	DSR	RTS-	NC
7	RTS	RTS+	NC
8	CTS	CTS+	NC
9	RI	CTS-	NC
10	NC	NC	NC

2-11 KEYBOARD CONNECTOR

DIN : Keyboard Connector
The keyboard connector can support PC/AT Keyboard.
The pin assignments for keyboard are as follow :

PIN	ASSIGNMENT
1	KBDATA
2	NC
3	GND
4	VCC
5	KBCLK
6	NC



DIN

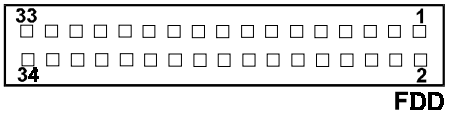
2-12 EXTERNAL KEYBOARD CONNECTOR

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

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

2-13 FLOPPY DISK DRIVE CONNECTOR

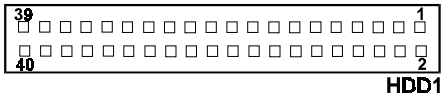
FDD : Floppy Disk Drive Connector
You can use a 34-pin daisy-chain cable to connect a two-FDDs. On one end of this cable is a 34-pin flat cable to attach the FDD on the board, the other side is to attach two FDDs.
The pin assignments are as follow :



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

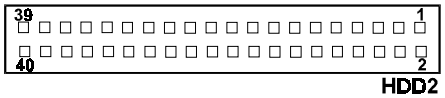
2-14 HARD DISK DRIVE CONNECTOR

HDD1: Hard Disk Drive Connector
The PC-560 possess two HDD connectors, HDD1 and HDD2. The pin assignments are as follow:



PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	IDERST	21	IDEREQ0
2	GND	22	GND
3	IDED7	23	IDEIOW
4	IDED8	24	GND
5	IDED6	25	IDEIOR
6	IDED9	26	GND
7	IDED5	27	IDERDY
8	IDED10	28	PULL HI
9	IDED4	29	IDEACK0
10	IDED11	30	GND
11	IDED3	31	IRQ14
12	IDED12	32	IOCS16
13	IDED2	33	IDEA1
14	IDED13	34	GND
15	IDED1	35	IDEA0
16	IDED14	36	IDEA2
17	IDED0	37	IDECS1P
18	IDED15	38	IDECS3P
19	GND	39	IDELEDP
20	N.C.	40	GND

HDD2: Hard Disk Drive Connector
The pin assignments are as follow:

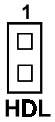


PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	IDERST	21	IDEREQ1
2	GND	22	GND
3	IDED7	23	IDEIOW
4	IDED8	24	GND
5	IDED6	25	IDEIOR
6	IDED9	26	GND
7	IDED5	27	IDERDY
8	IDED10	28	PULL HI
9	IDED4	29	IDEACK1
10	IDED11	30	GND
11	IDED3	31	IDESIRQ
12	IDED12	32	IOCS16
13	IDED2	33	IDEA1
14	IDED13	34	GND
15	IDED1	35	IDEA0
16	IDED14	36	IDEA2
17	IDED0	37	IDECS1S
18	IDED15	38	IDECS3S
19	GND	39	IDELEDS
20	N.C.	40	GND

2-15 HARD DISK DRIVE LED CONNECTOR

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

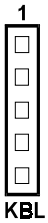
PIN	ASSIGNMENT
1	HDD Active Signal
2	Vcc



2-16 POWER LED & KEYLOCK CONNECTOR

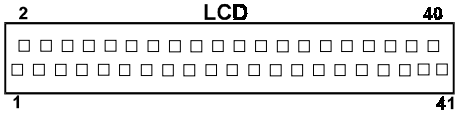
KBL : Power LED & Keylock Connector
The pin assignments are as follow :

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



2-17 LCD PANEL CONNECTOR

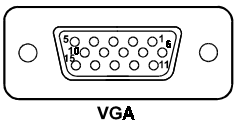
LCD : LCD Panel Connector
The connector LCD is a 41-pin, dual-in-line header used for Flat Panel displays.
The pin assignments are as follow :



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		

2-18 VGA CRT CONNECTOR

VGA : VGA CRT Connector
The pin assignments are as follow:

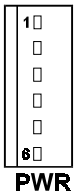


PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	RED	9	NC
2	GREEN	10	GND
3	BLUE	11	NC
4	NC	12	NC
5	GND	13	HSYNC
6	GND	14	VSYNC
7	GND	15	NC
8	GND		

2-19 POWER CONNECTOR

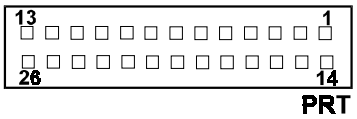
PWR : Power Connector
The pin assignments are as follow :

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



2-20 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 :

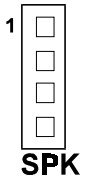


PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	STB	14	AUTFE
2	P0	15	ERROR
3	P1	16	INIT
4	P2	17	SLCTIN
5	P3	18	GND
6	P4	19	GND
7	P5	20	GND
8	P6	21	GND
9	P7	22	GND
10	ACK	23	GND
11	BUSY	24	GND
12	PE	25	GND
13	SLCT	26	NC

2-21 EXTERNAL SPEAKER CONNECTOR

SPK : External Speaker Connector
The pin assignments are as follow :

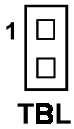
PIN	ASSIGNMENT
1	VCC
2	Ground
3	NC
4	Speaker Signal



2-22 TURBO LED

TBL : Turbo LED Connector
The pin assignments are as follow :

PIN	ASSIGNMENT
1	Vcc
2	Turbo Signal



2-23 MEMORY INSTALLING

The PC-560 PCI local bus Embedded Computer will support 4 DRAM banks,

Note: SIMM 1,2 for single & double Bank DRAM module (72pin x 32bit x 2)

DRAM BANK CONFIGURATION

SIMM 1 BANK 0,1	SIMM 2 BANK 2,3	TOTAL MEMORY
1M		1M
1M	1M	2M
2M		2M
1M	2M	3M
2M	2M	4M
4M		4M
1M	4M	5M
2M	4M	6M
4M	4M	8M
8M		8M
2M	8M	10M
4M	8M	12M
8M	8M	16M
4M	16M	20M
16M	16M	32M
32M		32M
8M	32M	40M
16M	32M	48M
32M	32M	64M
32M	64M	96M
64M	64M	128M

SOFTWARE UTILITIES

CHAPTER
3

This chapter comprises the detailed information of VGA and Watchdog function; also describe how to install the configurations.

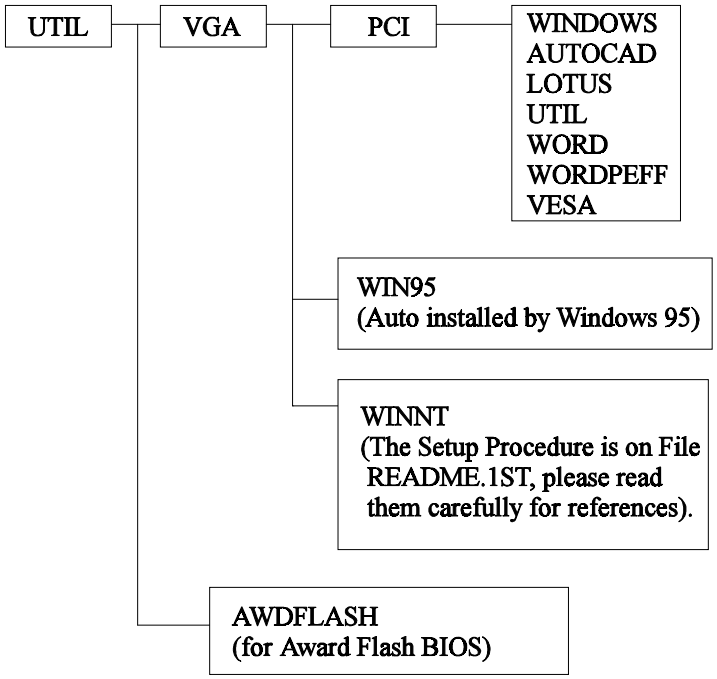
Sections include:

- VGA Configuration
- How to Install VGA Driver for PCI
- Flash BIOS Update
- Watchdog Timer Configuration

3-1. VGA CONFIGURATION

The VGA interface for PC-560 Pentium CPU Card can support a great range of displays, such as SVGA, STN, TFT, EL.....etc. You can display CRT and LCD Panel simultaneously on this board, but make sure the modes for both CRT and LCD Panel must be the same. If not, only the CRT can be displayed.

This card encloses with one Utility Disk; it contains two files: VGA.EXE and AWDFLASH.EXE. The directions are 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.

3-2. HOW TO INSTALL VGA DRIVER FOR PCI

Change prompt path to C:\UTIL\VGA\PCI and key-in setup. For example,

```
C:\>
C:\CD\UTIL\VGA\PCI>
C:\CD\UTIL\VGA\PCI>SETUP
```

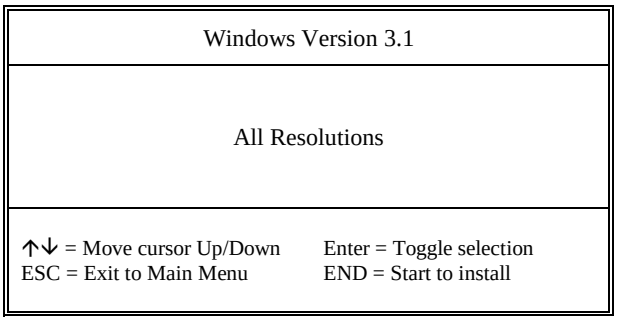
Press < Enter >, then the screen will display following tables :

DISPLAY DRIVER SETUP PROGRAM -Version 2.10- (C) Copywriter 1992,1995, Chips and Technologies, Inc.
DECOMPILATION OR DISASSEMBLY PROHIBITED CHIPS 655XX - PCI Display Drivers Version 3.2.1 <<< Press any key to continue >>>

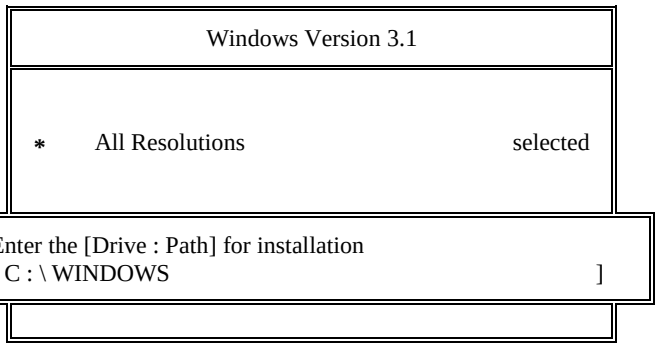
Follow the display messages to install VGA driver for PCI

Select any Application Driver to Install
Windows Version 3.1 AutoCAD Release 12 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

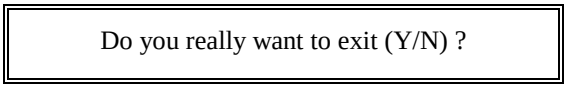
If you select “Windows Version 3.1”, the table below will appear on screen.



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



Please key-in 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.



Select the answer as you require.

3-3. FLASH BIOS UPDATE

You can use the AWDFLASH.EXE to update your VGA and system BIOS. Change path to

C:\UTIL\AWDFLASH>AWDFLASH

Enter the FILENAME. BIN (2A5KFP69.BIN); the screen will display the table below.

FLASH MEMORY WRITER v5.0 Copyright (C) 1993, Award Software, Inc.,
For ALI-1521/1523-2A5KFP69 DATE : 01/15/96 Flash Type - File Name to Program : FILENAME.BIN
Error Message : Do You Want To Save BIOS (Y/N)

If you want to save up the original BIOS, enter “Y ”and press < Enter > then key-in the FILENAME.BIN. If you choose “N”, the following table will appear on screen.

FLASH MEMORY WRITER v5.0 Copyright (C) 1993, Award Software, Inc.,
For ALI-1521/1523-2A5KFP69 DATE : 01/15/96 Flash Type - File Name to Program : FILENAME.BIN
Error Message : Are You Sure To Program (Y/N)

Enter the FILENAME.BIN and select “Y”, and the BIOS will being renewed. Notice, when you are refreshing your BIOS, do not turn off or reset the system, or you will damage the BIOS. After you have completed all the programming, the message will inform you “Programming Flash Memory - 1FFFF ok”. Please power off or reset the system. Then the Flash BIOS is implemented.

3-4. 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-560 watchdog function, You must write your program so when it writes I/O port address 443 for enable watchdog and write I/O port address 441 for disable watchdog. The timer's intervals have a tolerance of 25% so you should program an instruction 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
OUT     DX, AX
```

Watchdog disable program:

```
MOV     AX, 000FH     (this value can be ignored)
MOV     DX, 441H
OUT     DX, AX
```

The Watchdog Timer control table is as follow:

Level	Value	Time/sec	Level	Value	Time/sec
1	F	0	9	7	16
2	E	2	10	6	18
3	D	4	11	5	20
4	C	6	12	4	22
5	B	8	13	3	24
6	A	10	14	2	26
7	9	12	15	1	28
8	8	14	16	0	30

GREEN PC FUNCTION

CHAPTER

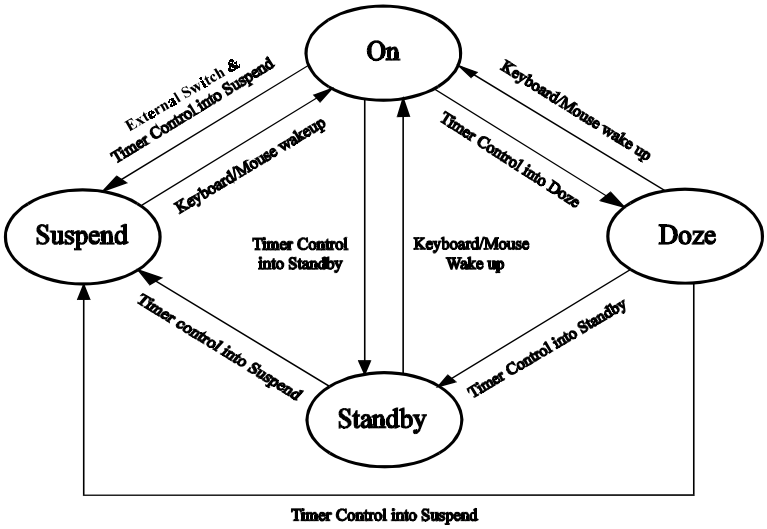
4

This chapter gives you the concise information for Green PC Function.

Sections include:

- Power Saving Block Diagram
- CPU Doze Mode
- System STANDBY Mode
- System SUSPEND Mode

4-1. POWER SAVING BLOCK DIAGRAM



4-2. CPU DOZE MODE

1. After out of the timer, CPU clock is slow down to 8MHz.
2. Sound 1 beep.
3. Flash LED to indicate power saving status.
4. Monitor Activity, according to the setting of Advanced Setup.
5. Any activity occurs, system will exit from Doze mode to On mode.

4-3. SYSTEM STANDBY MODE

1. After out of the timer, CPU clock is slow down to 8MHz.
2. Sound 2 beeps.
3. Flash LED to indicate power saving status.
4. Level 1 cache are disabled.
5. VGA monitor displays blank screen.
6. Fixed disk driver motor will be spin off.
7. Any activity occurs, system will exit from Standby mode to On mode.

4-4 SYSTEM SUSPEND MODE

1. After out of the timer, CPU clock is slow down to 8MHz, if you use Intel, Pentium or Cyrix (SMI) CPU, then CPU clock will be stopped.
2. Sound 3 beeps.
3. Flash LED to indicate power saving status.
4. Level 2 cache are disabled.
5. VGA monitor displays blank screen.
6. Fixed disk driver motor will be spin off.
7. Monitor activity according to the setting of Advanced Setup.
8. When system in Suspend mode, only Keyboard / Mouse / Alarm resume can wakeup system.

AWARD BIOS SETUP

CHAPTER

5

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

Sections include:

- Introduction
- Entering Setup
- The Standard CMOS Setup
- The BIOS Features Setup
- The Chipset Features Setup
- Power Management Setup
- PNP/PCI Configuration
- Load BIOS defaults
- Integrated Peripherals
- IDE HDD Auto Detection
- Save Setup

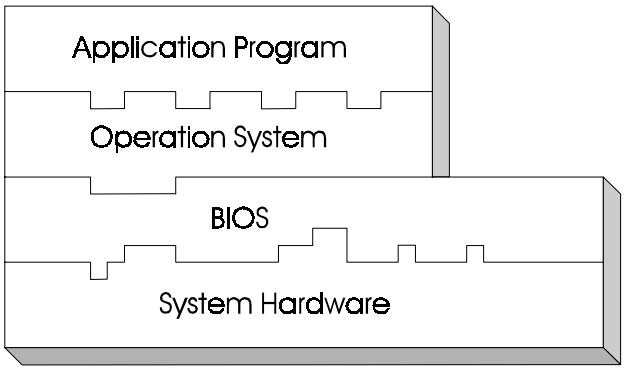
5-1. INTRODUCTION

This chapter will show you the function of a BIOS in managing the features of your system. The PC-560 Pentium Embedded Card is equipped with the BIOS for system chipset from Award 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:



5-2 ENTERING SETUP

Power on the computer and press < Del > immediately will allow you to enter Setup. The other way to enter Setup is to power on the computer, when the below message appears briefly at the bottom of the screen during the POST (Power On Self Test), press < Del > key or simultaneously press <Ctrl>, < Alt >, and < Esc > keys.

TO ENTER SETUP BEFORE BOOT PRESS <CTRL-ALT-ESC> OR <DEL> KEY

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 menu of the Award SETUP program will appear on the screen:

ROM / PCI / ISA BIOS (2A5KFP69) CMOS SETUP UTILITY AWARD SOFTWARE, INC.	
STANDARD CMOS SETUP	INTEGRATED PERIPHERALS
BIOS FEATURES SETUP	SUPERVISOR PASSWORD
CHIPSET FEATURES SETUP	USER PASSWORD
POWER MANAGEMENT SETUP	IDE HDD AUTO DETECTION
PNP/PCI CONFIGURATION	HDD LOW LEVEL FORMAT
LOAD BIOS DEFAULTS	SAVE & EXIT SETUP
LOAD SETUP DEFAULTS	EXIT WITHOUT SAVING
Esc : Quit F10 : Save & Exit Setup	↑↓→← :SELECT ITEM (Shift)F2 : Change Color
Time, Date, Hard Disk Type.....	

Setup program initial screen

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 Shift F2 keys to scroll through the various color combinations available.

5-3 THE STANDARD CMOS SETUP MENU

Highlight STANDARD CMOS SETUP and press < ENTER > and the screen will display the following table:

ROM PCI / ISA BIOS (2A5KFP69)
STANDARD CMOS SETUP
AWARD SOFTWARE, INC.

Date (mm:dd:yy) : Mon Jan 1 1996
Time (hh:mm:ss) : 0 : 4 : 10

	CYLS.	HEADS	PRECOMP	LANDZONE	SECTORS	MODE
Primary Master : Auto (Mb)	0	0	0	0	0	AUTO
Primary Slave : Auto (Mb)	0	0	0	0	0	AUTO
Secondary Master : Auto (Mb)	0	0	0	0	0	AUTO
Secondary Slave : Auto (Mb)	0	0	0	0	0	AUTO

Drive A : 1.44M , 3.5 in.
Drive B : None

Video : EGA/VGA

Halt On: All Errors

Base Memory: 640K
Extended Memory: 7168K
Other Memory: 384K
Total Memory: 8192K

Esc : Quit ↑↓→← :Select Item Pu/Pd/+/- : Modify
F1 : Help (Shift) F2 : Change Color

CMOS setup screen

In the above table 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 screen shows a calendar. The week display will depend on the date set in your system clock and the flashing indicating the current date. Since you have not yet set the time and date, the date displayed is probably incorrect. Information on each item is

Date:

< Month >, < Date > and <Year >. Ranges for each value are in the CMOS Setup Screen, and the week-day will skip automatically.

Time:

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

Drive C type / Drive D type:

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.

Primary Master/Primary Slave/Secondary Master/Secondary Slave :

The categories identify the types of 2 channels that have been installed in the computer. There are 45 predefined types and 4 user definable types are for Enhanced IDE BIOS. Type 1 to Type 45 are predefined. Type User is user-definable.

Press PgUp / <+> or PgDn / <-> to select a numbered hard disk type or type the number and press < Enter >. Note that the specifications of your drive must match with the drive table. The hard disk will not work properly if you enter improper information for this category. If your hard disk drive type is not matched or listed, you can use Type User to define your own drive type manually.

If you select Type User, related information is asked to be entered to the following items. Enter the information directly from the keyboard and press < Enter >. This information should be provided in the documentation from your hard disk vendor or the system manufacturer.

If the controller of HDD interface is ESDI, the selection shall be "Type 1".

If the controller of HDD interface is SCSI, the selection shall be "None"
If the controller of HDD interface is CD-ROM, the selection shall be "None"

TYPE:

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

CYLS.:

This is the number of cylinders found in the specified drive type.

HEADS:

This is the number of heads found in the specified drive type.

PRECOMP:

WPcom is the read delay circuitry which takes into account the timing differences between the inner and outer edges of the surface of the disk platter. The number designates the starting cylinder of the signal.

LZONE:

Lzone is the landing zone of the heads. This number determines the cylinder location where the heads will normally park when the system is shut down.

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)

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.

VIDEO:

Options are Monochrome, Color 40, VGA/EGA, Color 80.

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			

Award Hard Disk Type Table

5-4 The BIOS FEATURES SETUP MENU

Choose the "BIOS FEATURES SETUP" in the main menu, the screen shown as below.

ROM PCI/ISA BIOS (2A5KFP69)
BIOS FEATURES SETUP
AWARD SOFTWARE, INC.

Virus Warning	: Disabled	Video BIOS Shadow	: Enabled
CPU Internal Cache	: Enabled	C8000-CBFFF Shadow	: Disabled
External Cache	: Enabled	CC000-CFFFF Shadow	: Disabled
Quick Power On Self Test	: Disabled	D0000-D3FFF Shadow	: Disabled
Boot Sequence	: A,C	D4000-D7FFF Shadow	: Disabled
Swap Floppy Drive	: Disabled	D8000- DBFFF Shadow	: Disabled
Boot Up Floppy Seek	: Enabled	DC000-DFFFF Shadow	: Disabled
Boot Up Numlock Status	: ON		
Boot Up System Speed	: High		
Gate A20 Option	: Fast		
Memory Parity Check	: Disabled		
Typematic Rate Setting	: Disabled		
Typematic Rate (Chars/Sec)	: 6		
Typematic Delay (Msec)	: 250	Esc : Quit	↑↓→← : Select Item
Security Option	: Setup	F1 : Help	Pu/Pd/+/- : Modify
PS/2 mouse function control	: Enabled	F5 : Old Values	(Shift)F2 : Color
PCI/VGA Palatal snoop	: Disabled	F6 : Load BIOS Defaults	
OS Select For DRAM > 64Mb	: Non-OS2	F7 : Load Setup Defaults	

BIOS Features Setup

The BIOS FEATURES SETUP allows you find true certain features supported by the chipset and Award 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.

This is detailed later. To get help on each item, highlight the relevant item and press the F1 key. A Windows will appear on your screen detailing the various options available for each item. A brief introduction of each setting in the BIOS FEATURES SETUP program is given below.

CPU INTERNAL CACHE:

This item should always be Enable, If your system is 486CPU. Even if you have installed the external cache. If you have no external cache installed this item should be enabled to allow use of the internal 8K cache in the 486 CPU.

EXTERNAL CACHE:

Enable or disable this function according to whether you want external cache enabled or disabled.

QUICK POWER ON SELF TEST:

You can enable or disable this item to speed up Power On Self Test (POST) after you power on the computer. If it is set to Enable, BIOS will shorten or skip some check items during POST.

BOOT SEQUENCE:

You may define whether the system will look first at drive A: and then at drive C: when booting up, or vice versa.

BOOT UP FLOPPY SEEK:

You may enable / disable this item to define whether the system will look for a floppy disk drive to boot at power-on, or directly to the hard disk drive.

BOOT UP NUMLOCK STATUS:

Use this item to enable / disable the NumLock on your keyboard automatically at power-on.

BOOT UP SYSTEM SPEED:

Select High to configure your system in the turbo speed mode at boot up, select Low to configure your system in normal speed mode. Whichever setting you choose you will still be able to use the turbo switch to toggle between the tow modes during use.

MEMORY PARITY CHECK:

Enable or Disable this item according to whether you wish the system to check the memory parity during boot up or not. If you disable this item even if the BIOS encounters a parity error it will be ignored. We re-commend that you always enable the item in order to ensure that the memory is good each time you turn your PC on.

GATE 20A OPTION:

When you set this category as Fast. The A20 signal is controlled by chipset specific method.

TYPEMATIC RATE SETTING:

Enable this item if you wish to be able to configure the characteristics of your keyboard. Typematic refers to the way in which characters are entered repeatedly if a key is held down. For example, if you press and hold down the "A" key, the letter "a" will repeatedly appear on your screen on your screen until you release the key. This item is disable by default.

TYPEMATIC RATE (CHARS-SEC):

You can use this item to define the typematic rate delay of your keyboard, i.e. the rate at which characters will be repeated when a key held down.

TYPEMATIC DELAY (MSEC):

You can use this item to define the period after which the typematic function become active i.e. how long after you press a key the characters will be repeated.

SECURITY OPTION:

This category allows you to limit access to the system and Setup, or just to Setup. To disable security, select PASSWORD SETTING at Main Menu and then you will be asked to enter password. Do not type anything and just press <Enter>, it will disable security. Once the security is disabled, the system will boot and you can enter Setup freely.

5-5 CHIPSET FEATURE SETUP

Choose the "CHIPSET FEATURES SETUP" from the main menu, the screen shown as below.

ROM PCI/ISA BIOS (2A5KFP69)
CHIPSET FEATURES SETUP
AWARD SOFTWARE, INC.

Auto Configuration	: Enable	VGA Frame Buffer	: Enabled
AT BUS Clock	: CLK2/4	Linear Merge	: Enabled
Asysc. SRAM Write WS	: X-3-3-3	Word Merge	: Enabled
Asysc. SRAM Read WS	: X-3-3-3	Byte Merge	: Disabled
EDO Read WS	: X-3-3-3	Fast Back-to-Back	: Disabled
Page Mode Read WS	: X-3-3-3	PCI Write Burst	: Enabled
DRAM Write WS	: X-2-2-2	Turbo Buffer	: Enabled
CPU to DRAM page Mode	: Disabled		
DRAM Refresh Period	: 60 us		
DRAM Posted Write	: Enabled		
DRAM Data Integrity Mode	: Parity		
Support Dynamic W-Back	: Disabled		
Pipelined Function	: Disabled		
16 Bit ISA I/O Command WS	: 2 Wait		
16 Bit ISA Mem Command WS	: 2 Wait		
Local Memory 15-16M	: Enabled	Esc : Quit	↑↓→← : Select Item
Passive Release	: Enabled	F1 : Help	Pu/Pd/+/- : Modify
ISA Line Buffer	: Enabled	F5 : Old Values	(Shift)F2 : Color
Delay Transaction	: Enabled	F6 : Load BIOS Defaults	
Primary Frame Buffer	: 2 MB	F7 : Load Setup Defaults	

Chipset Features Setup

By moving cursor to the desired selection and pressing < F1 > key, the all options for the desired selection will be displayed for choice. User has to use select the desired option.

AUTO CONFIGURATION FUNCTION:

When this option is Enabled, the BIOS automatically configures cache and clock settings based on detection of the CPU clock speed, you cannot change the other parameters. Set this option to Disabled to manually set DRAM, cache and I/O bus clock operating parameters.

DRAM Mode:

The number of wait states added on reads to DRAM. Fewer wait states improve performance.

SRAM Mode:

The number of wait states added on reads to SRAM. Fewer wait states improve performance.

AT BUS CLOCK:

Defines the clock value for AT bus. Usually, AT bus clock should be programmed to 8Mhz, e.g. when system clock is 33Mhz, choose 4/1 CLKIN. All values derived from CLKIN is called synchronous mode. The 7.159Mhz option is called asyc. mode.

5-6 POWER MANAGEMENT SETUP

Choose "POWER MANAGEMENT SETUP" option on the main menu, a display will be shown on screen as below :

ROM PCI/ISA BIOS (2A5KFP69)
POWER MANAGEMENT SETUP
AWARD SOFTWARE, INC.

Power Management	: Disable	IRQ6	(Floppy Disk)	: ON
PM Control by APM	: Yes	IRQ7	(LPT 1)	: ON
MODEM Use IRQ	: NA	IRQ8	(RTC Alarm)	: OFF
Video Off Option	: Susp,Stby->off	IRQ9	(IRQ Redir)	: ON
Video Off Method	: DPMS Support	IRQ10	(Reserved)	: OFF
		IRQ11	(Reserved)	: OFF
** PM Timer **		IRQ12	(PS/2 Mouse)	: ON
HDD Power Down	: Disabled	IRQ13	(Coprocessor)	: OFF
Doze Mode	: Disabled	IRQ14	(Hard Disk)	: ON
Standby Mode	: Disabled	IRQ15	(Reserved)	: OFF
Suspend Mode	: Disabled			
** PM Events **				
VGA	: OFF			
DRQ	: ON			
IRQ1 (Keyboard)	: ON	Esc : Quit	↑↓→← :	Select Item
IRQ3 (COM 2)	: ON	F1 : Help	Pu/Pd/+/- :	Modify
IRQ4 (COM 1)	: ON	F5 : Old Values	(Shift)F2 :	Color
IRQ5 (LPT 2)	: ON	F6 : Load BIOS Defaults		
IRQ6 (Floppy Disk)	: ON	F7 : Load Setup Defaults		

Power Management Setup

This category determines how much power consumption for system after selecting below items. Default value is Disable. Having made all the settings above, press < Esc > to return to the main menu.

POWER MANAGEMENT:

This item determines how much power consumption for system. When you define it as Max Saving are used all timers MIN value.

PM CONTROL BY APM:

When this item is set to be YES, the system BIOS will wait for APM's prompt before it enter any PM mode e.g. DOZE, STANDBY or SUSPEND. If APM is installed, & if there is a task running, even the timer is time out, the APM will not prompt the BIOS to put the system into any power saving mode.

DOZE MODE TIMEOUT:

Sets the time interval after inactivity when the system enters Doze mode. This options as following, from 10 Sec to 2 Hours or Disabled.

STANDBY MODE TIMEOUT:

Sets the time interval after system inactivity when the system enters STANDBY mode. This options as following: From 30 Sec to 2 Hours or Disabled.

SUSPEND MODE TIMER:

Sets the time interval after system inactivity when the system enters SUSPEND mode. This options as following: From 30 Sec to 2 Hours or Disabled.

5-7 PNP/PCI CONFIGURATION

Choose " PNP/PCI CONFIGURATION" from the main menu, a display will be shown on screen as below:

ROM PCI/ISA BIOS (2A5KFP69)
PNP/PCI CONFIGURATION
AWARD SOFTWARE, INC.

Resources Controlled by	: Manual	PCI IDE 2nd Channel	: Disabled
Reset Configuration Data	: Disabled	PCI IRQ Actived By	: Level
		PCI IDE IRQ Map To	: ISA
IRQ-3 assigned to	: Legacy ISA		
IRQ-4 assigned to	: Legacy ISA		
IRQ-5 assigned to	: PCI/ISA PnP		
IRQ-7 assigned to	: Legacy ISA		
IRQ-9 assigned to	: PCI/ISA PnP		
IRQ-10 assigned to	: PCI/ISA PnP		
IRQ-11 assigned to	: PCI/ISA PnP		
IRQ-12 assigned to	: PCI/ISA PnP		
IRQ-14 assigned to	: Legacy ISA		
IRQ-15 assigned to	: Legacy ISA		
DMA-0 assigned to	: PCI/ISA PnP		
DMA-1 assigned to	: PCI/ISA PnP	Esc : Quit	↑↓→← : Select Item
DMA-3 assigned to	: PCI/ISA PnP	F1 : Help	Pu/Pd/+/- : Modify
DMA-5 assigned to	: PCI/ISA PnP	F5 : Old Values	(Shift)F2 : Color
DMA-6 assigned to	: PCI/ISA PnP	F6 : Load BIOS Defaults	
DMA-7 assigned to	: PCI/ISA PnP	F7 : Load Setup Defaults	

PNP/PCI CONFIGURATION

You can manually configurate the PnP/PCI Device's IRQ. HIghlight the selected item and pressing <F1> key, the all options for the desired selection will be displayed for choice. User has to use select the desired options. Having made all the above setting according to your configuraton. Press <Esc> to return to the main menu.

5-8 LOAD BIOS DEFAULTS

AUTO CONFIGURATION WITH BIOS DEFAULTS

"LOAD BIOS DEFAULTS" loads the default BIOS values. When the diagnostic aid of your system becomes unusable, choose this option and the following message appears :

Load BIOS Defaults (Y / N) ? N

To use the BIOS defaults, change the prompt to "Y" and press < Enter >, the CMOS is load automatically when you power on the PC-560.

5-9 LOAD SETUP DEFAULTS

Auto configuration With Setup Defaults

This Main Menu item uses the default SETUP values. Use this option as a diagnostic aid of your system behaves erratically. Choose this item and the following message appears:

Load SETUP Defaults (Y/N)?N

To use the SETUP defaults, change the prompt to "Y" and press <Enter> The CMOS is load automatically form SETUP default values:

5-10 INTEGRATED PERIPHERALS

Choose " INTEGRATED PERIPHERALS" from the main menu, a display will be shown on screen as below:

ROM PCI/ISA BIOS (2A5KFP69)
INTEGRATED PERIPHERALS
AWARD SOFTWARE, INC.

On-Chip IDE Controller	: Enabled	Onboard Parallel Port	: 378/IRQ7
The 2nd Channel IDE	: Enabled	Parallel Port Mode	: Normal
IDE Primary Master PIO	: Auto		
IDE Primary Slave PIO	: Auto		
IDE Secondary Master PIO	: Auto		
IDE Secondary Slave PIO	: Auto		
IDE Primary Master FIFO	: Disabled		
IDE Primary Slave FIFO	: Disabled		
IDE Secondary Master FIFO	: Disabled		
IDE Secondary Slave FIFO	: Disabled		
IDE HDD Block Mode	: Enabled		
IDE 32-bit Transfer Mode	: Enabled		
Onboard FDC Controller	: Enabled	Esc : Quit	↑↓→← : Select Item
Onboard UART 1	: 3F8/IRQ 4	F1 : Help	Pu/Pd/+/- : Modify
UART 1 operation mode	: Standard	F5 : Old Values	(Shift)F2 : Color
Onboard UART 2	: 2F8/IRQ 3	F6 : Load BIOS Defaults	
UART 2 operation mode	: Standard	F7 : Load Setup Defaults	

INTEGRATED PERIPHERALS

By moving cursor to the desired selection and pressing <F1> key, the all options for the desired selection will be displayed for choice. User has to use select the desired option. Having made all the setting according to your selections. Press <Esc> to return to the Main Menu.

5-11 PASSWORD SETTING

If you want to enable this item you should choose the "SUPERVISOR PASSWORD“ and ”USER PASSWORD“ option from the main menu, the following message will appear at the center of the screen to assist you in creating a password.

Enter Password:

Type the password, up to eight characters, and press < Enter >. The password typed now will clear any previously entered password from CMOS memory. You will be asked to confirm the password. Type the password again and press < Enter >. You may also press < Esc > to abort the selection and not enter a password.

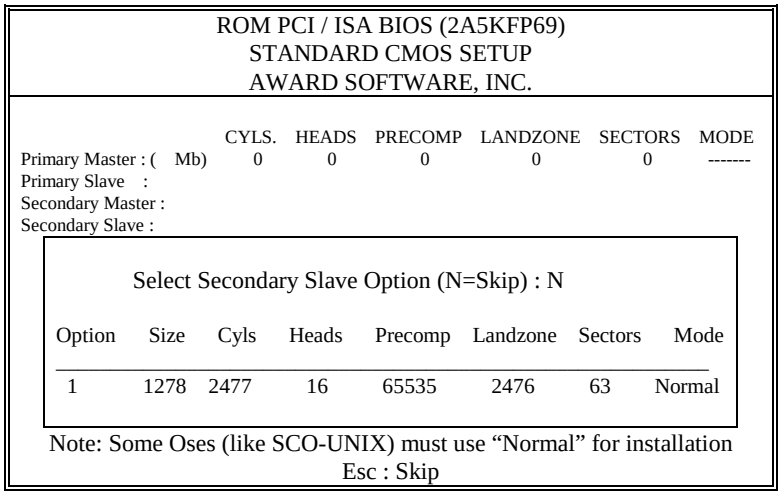
To disable password, just press < Enter > when you are prompted to enter password. A message will confirm the password being disable. Once the password is disabled, the system will boot and you can enter Setup freely.

Press any key to continue ....

If you select System at Security Option of BIOS Features Setup Menu, you will be prompted for the password every time the system is rebooted or any time you try to enter Setup. If you select Setup at Security Option of BIOS Features Setup Menu, you will be prompted only when you try to enter Setup.

5-12 IDE HDD AUTO DETECTION

Choose the "IDE HDD AUTO DETECTION" option . The screen will be shown as below.



IDE HDD AUTO DETECTION Screen

AUTO DETECTION

BIOS setup will display all possible modes that supported by the HDD including NORMAL, LBA, & LARGE.

If HDD does not support LBA mode, ‘LBA’ option will be shown.

If no of cylinders is less then or equal to 1024, no ‘LARGE’ option will be shown.

User can select a mode which is appropriate for then.

HDD MODE

The Award BIOS supports 3 HDD mode: NORMAL, LBA, & LARGE

NORMAL mode:
Generic access mode in which neither the BIOS nor the IDE controller will make any transformations during accessing.

The maximum number of cylinders, heads & sectors for NORMAL mode are 1024, 16, &63.

	no. Cylinder	(1024)
x	no. Head	(16)
x	no. Sector	(63)
x	no. Per sector	(512)
	Total:	528 Mega byte

If user set his HDD to NORMAL mode, the maximum accessible HDD size will be 528 Megabytes even though its physical size may be greater than that.

LBA (logical Block Addressing) mode:
A new HDD accessing method to overcome the 528 Megabyte bottleneck. The number of cylinders. head & sectors shown in setup may not be the number physically contained in the HDD.

During HDD accessing, The IDE controller will transform the logical address described by sector, head & cylinder number into its own physical address inside the HDD.

The maximum HDD size supported by LBA mode is 8.4 Gigabyte which is obtained by the following formula:

	no. Cylinder	(1024)
x	no. Head	(255)
x	no. Sector	(63)
x	no. Per sector	(512)
	Total:	8.4 Giga byte

LARGE mode:
Some IDE HDDs contain more than 1024 cylinder without LBA support (in some cases, user do not want LBA). The BIOS provides another alternative to support these kinds of HDD.

CYLS	HEADS	SECTOR	MODE
1120	16	59	NORMAL
560	32	59	LARGE

BIOS tricks DOS (or other OS) that the number of cylinder is less than 1024 by dividing it by 2. At the same time, the number of heads is multiplied by 2. A reverse transformation process will be made inside INT 13h in order to access the right HDD address the right HDD address.

Maximum HDD size:

no. Cylinder	(1024)
x no. Head	(32)
x no. Sector	(63)
x no. Per sector	(512)
Total: 1 Giga byte	

REMARKS:
To support LBA or LARGE mode of HDDs, there must be some softwares involved. All these softwares are located in the Award HDD Service Routine (INT 13h). It may be failed to access a HDD with LBA(LARGE) mode selected if you are running under a Operating System which replaces the whole INT 13h.

5-13 HDD LOW LEVEL FORMAT

Choose " INTEGRATED PERIPHERALS" from the main menu, a display will be shown on screen as below:

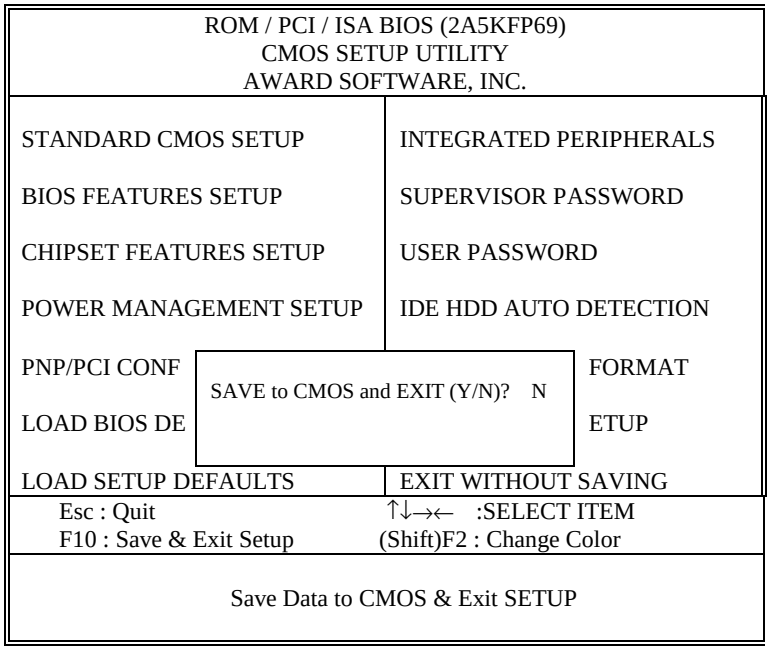
Hard Disk Low Level Format Utility								NO. CYLS HEAD
---------- SELECT DRIVE ---------- ---------- BAD TRACK LIST ---------- ---------- PREFORMAT ----------								
Current Select drive is : C DRIVE : C CYLINDER : 0 HEAD : 0								
	SIZE	CYLS	HEAD	PRECOMP	LANDZ	SECTOR	MODE	
Primary Master :	539	1046	16	65535	1045	63	AUTO	
Primary Slave :	0	0	0	0	0	0	AUTO	
Secondary Master :	0	0	0	0	0	0	AUTO	
Secondary Slave :	0	0	0	0	0	0	AUTO	
Up/Down - Select item Enter - Accept ESC - Exit / Abort Copyright (C) Award Software, Inc. 1992-94 All Rights Reserved								

HDD LOW LEVEL FORMAT

By moving cursor to the desired selection and pressing <F1> key, the all options for the desired selection will be displayed for choice. User has to use select the desired option. Having made all the setting according to your selections. Press <Esc> to return to the Main Menu.

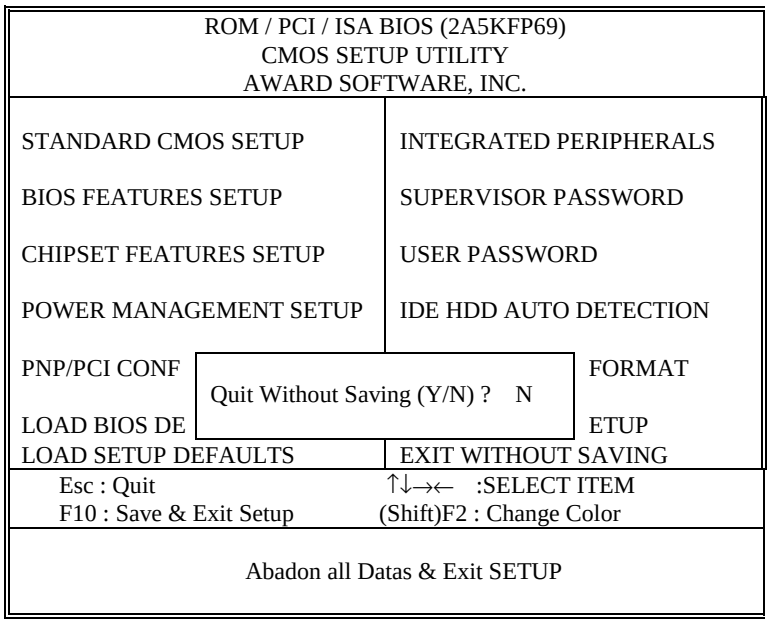
5-14 SAVE & EXIT SETUP

When you have completed adjusting all the settings as required, you must have these setting into the CMOS RAM. Select SAVE & EXIT and press<Enter>, as the display shown on below:



When you confirm that 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 the <Del> key during boot up.

If wish to cancel any changes you have made, select EXIT WITHOUT SAVING and the original setting stored in the CMOS will be retained. The screen will be shown as below:



EXPANSION BUS

APPENDIX

A

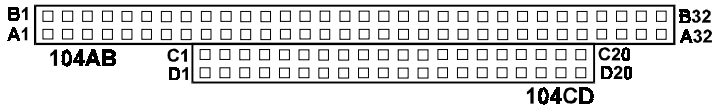
This appendix indicates you the pin assignments.

Sections include:

- PC-104 Connector Pin Assignment
- ISA BUS Pin Assignment

PC-104 CONNECTOR PIN ASSIGNMENT

104AB, 104CD : PC-104 Connector



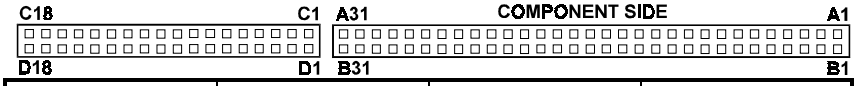
The PC-104 can support multi-pieces of PC-104 modules. This card has two connectors : one (104AB) consists of 64 pin; the other one (104CD) consists of 40 pin, both of them are dual-in-line headers
The pin assignments for connector 104AB & 104CD are as follow:

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				

ISA BUS PIN ASSIGNMENT

The ISA BUS for this card is called “Gold Fingers”. It is divided into two sets : one consists of 62 pins; the other consists of 36 pins.

The pin assignments are as follow :



B		A		D		C	
PIN	ASSIGNMENT	PIN	ASSIGNMENT	PIN	ASSIGNMENT	PIN	ASSIGNMENT
B1	GND	A1	-I/O CH CHK	D1	-MEMCS16	C1	SBHE
B2	RESET	A2	SD07	D2	-I/OCS16	C2	LA23
B3	+5V	A3	SD06	D3	IRQ10	C3	LA22
B4	IRQ9	A4	SD05	D4	IRQ11	C4	LA21
B5	-5V	A5	SD04	D5	IRQ12	C5	LA20
B6	DRQ2	A6	SD03	D6	IRQ15	C6	LA19
B7	-12V	A7	SD02	D7	IRQ14	C7	LA18
B8	OWS	A8	SD01	D8	-DACK0	C8	LA17
B9	+12V	A9	SD00	D9	DRQ0	C9	-MEMR
B10	GND	A10	-I/O CH RDY	D10	-DACK5	C10	-MEMW
B11	-SMEMW	A11	AEN	D11	DRQ5	C11	SD08
B12	-SMEMR	A12	SA19	D12	-DACK6	C12	SD09
B13	-IOW	A13	SA18	D13	DRQ6	C13	SD10
B14	-IOR	A14	SA17	D14	-DACK7	C14	SD11
B15	-DACK3	A15	SA16	D15	DRQ7	C15	SD12
B16	-DRQ3	A16	SA15	D16	+5V	C16	SD13
B17	-DACK1	A17	SA14	D17	-MASTER	C17	SD14
B18	-DRQ1	A18	SA13	D18	GND	C18	SD15
B19	-REFRESH	A19	SA12				
B20	BCLK	A20	SA11				
B21	IRQ7	A21	SA10				
B22	IRQ6	A22	SA09				
B23	IRQ5	A23	SA08				
B24	IRQ4	A24	SA07				
B25	IRQ3	A25	SA06				
B26	-DACK2	A26	SA05				
B27	T/C	A27	SA04				
B28	BALE	A28	SA03				
B29	+5V	A29	SA02				
B30	OSC	A30	SA01				
B31	GND	A31	SA00				

TECHNICAL SUMMARY

APPENDIX

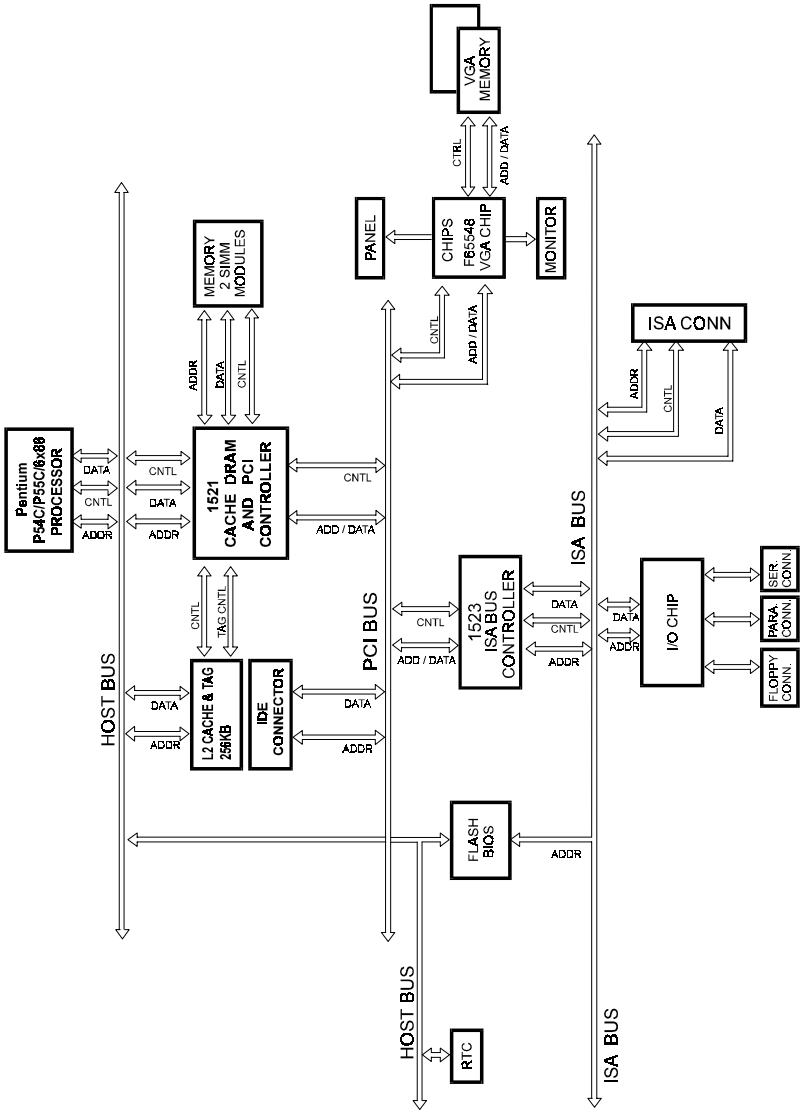
B

This section introduce you the maps concisely.

Sections include:

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

BLOCK DIAGRAM



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 2
6	Floppy Disk adapter
7	Parallel port 1
8	RTC clock
9	Available
10	Available
11	Available
12	Available
13	Math coprocessor
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 for PCI device ROM
00F0000-00FFFFF	System BIOS ROM
0100000-BFFFFFF	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 regsiters.
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

APPENDIX

C

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 Error Messages
- Trouble Shooting for POST Code

C-1 TROUBLE SHOOTING FOR 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.

POST BEEP :

Currently there are two kind of beep codes in BIOS. The one code indicates that a video error has occurred and the BIOS cannot initialize the video screen to display any additional information. This beep code consists of a single long beep followed by three short beeps. The other one code indicates that your DRAM error has occurred. This beep code consists of a single long beep repeatedly.

CMOS BATTERY FAILURE :

When the CMOS battery is out of work or has run out, the user has to replace the whole unit.

CMOS CHECKSUM ERROR :

This error inform you that the CMOS is corrupted. When the battery runs weak, this situation might happen. Please check the battery and change a new one when necessary.

DISPLAY SWITCH IS SET INCORRECTLY :

Display switch on the motherboard can be set to either monochrome or color. This indicates the switch is set to a different setting than indicated in Setup. Determine which setting is correct, and then either turn off the system and change the jumper, or enter Setup and change the video selection.

DISK BOOT FAILURE:

When you can‘t find the boot device, insert a system disk into Drive A and press < Enter >. Make sure both the controller and cables are all in proper positions, also make sure the disk is formatted correct device. Then reboot the system.

DISKETTE DRIVES OR TYPES MISMATCH ERROR :

When the diskette drive type is different from CMOS, please run setup or configure the drive again.

ERROR ENCOUNTERED INITIALIZING HARD DRIVE :

When you can‘t initialize the hard drive. Assure the adapter is installed correctly and all cables are correctly and firmly attached. Also be sure the correct hard drive type is selected in Setup.

ERROR INITIALIZING HARD DISK CONTROLLER :

When this error occurs. Be sure the cord is exactly installed in the bus. Make sure the correct hard drive type is selected in Setup. Also check whether all of the jumpers are set correctly in the hard drive.

FLOPPY DISK CONTROLLER ERROR OR NO CONTROLLER PRESENT :

When you cannot find or initialize the floppy drive controller, please check the controller whether in proper Setup. If there are no floppy drive installed, Ensure the Diskette Drive selection in Setup is set to NONE.

KEYBOARD ERROR OR NO KEYBOARD PRESENT :

When this situation happens, please check keyboard attachment and no keys being pressed during the boot. If you are purposely configuring the system without a keyboard, set the error halt condition in Setup to HALT ON ALL, BUT KEYBOARD. This will cause the BIOS to ignore the missing keyboard and continue the boot.

MEMORY ADDRESS ERROR :

When the memory address indicates error. You can use this location along with the memory map for your system to find and replace the bad memory chips.

MEMORY SIZE HAS CHANGED :

Memory has been added or removed since the last boot. In EISA mode use Configuration Utility to re-configure the memory configuration. In ISA mode enter Setup and enter the new memory size in the memory fields.

MEMORY VERIFYING ERROR :

It indicates an error verifying a value already written to memory. Use the location along with your system's memory map to locate the bad chip.

OFFENDING ADDRESS MISSING :

This message is used in connection with the I/O CHANNEL CHECK and RAM PARITY ERROR messages when the segment that has caused the problem cannot be isolated.

REBOOT ERROR :

When this error occurs that requires you to reboot.. Press any key and the system will reboot.

SYSTEM HALTED :

Indicates the present boot attempt has been aborted and the system must be rebooted. Press and hold down the CTRL and ALT keys and press DEL.

C-2 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 indicate you the error messages. Please follow the instruction to adjust your system. If the error still occurred, please contact with your distributor for maintenance.

C0 : Turn off OEM specific cache, shadow.....

03 : Initialize all the standard devices with default values Standard devices includes :
DMA controller (8237).
Programmable Interrupt Controller (8259).
Programmable Interval Timer (8254).
RTC chip.

05 : 1.Keyboard Controller Self-Test.
2.Enable Keyboard Interface.

07 : Verfies CMOS‘s basic R/W functionality.

BE : Program defaults values into chipset according to the MODBINable Chipset Default Table.

C1 : Auto-detection of onboard DRAM & Cache.

C5 : Copy the BIOS from ROM into E0000-FFFFF shadow RAM so that POST will go faster.

08 : Test the first 256K DRAM.

09 : 1. Program the configuration register of Cyrix CPU according to the MODBINable Cyrix Register Table.
2. OEM specific cache initialization (if needed).

0A : 1. Initialize the first 32 interrupt vectors with corresponding Interrupt handlers Initialize INT no from 33-120 with Dummy(Spurious) Interrupt Handler.
2. Issue CPUID instruction to identify CPU type.
3. Early Power Management initialization (OEM specific).

0B : 1.Verify the RTC time is valid or not.
2. Detect bad battery.
3. Read CMOS data into BIOS stack area.
4. PnP initializations including (PnP BIOS only).
-Assign CSN to PnP ISA card.
-Create resource map from ESCD.
5. Assign I/O & Memory for PCI devices (PCI BIOS only).

0C : Initialization of the BIOS Data Area (40 : 0N-40:FF).

0D : 1. Program some of the Chipset‘s value according to Setup. (Early Setup Value Program).
2. Measure CPU speed for display & decide the system clock speed.
3. Video initialization including Monochrome ,CGA, EGA/VGA. If no display device found, the speaker will beep.

0E : 1. Initialize the APIC (Multi-Processor BIOS only).
2. Test video RAM (If Monochrome display device found).
3. Show messages including :
-Award Logo, Copyright string, BIOS Date code & Part No.
-OEM specific sign on messages.
-Energy Star Loge (Green BIOS only).
-CPU brand, type & speed.
-Test system BIOS checksum (Non-compress Version only).

0F : DMA channel 0 test.

10 : DMA channel 1 test.

11 : DMA page registers test.

14 : Test 8254 Timer 0 Counter2.

15 : Test 8259 interrupt mask bits for channel 1.

16 : Test 8259 interrupt mask bits for channel 2.

19 : Test 8259 functionality.

30 : Detect Base Memory & Extended Memory Size.

31 : 1. Test Base Memory from 256K to 640K.
2. Test Extended Memory from 1M to the top of memory.

32 : 1.Display the Award Plug & Play BIOS Extension message (PnP BIOS only).
2.Program all onboard super I/O chips (if any) including COM ports, LPT ports, FDD port....according to setup value.

3C : Set flag to allow users to enter CMOS Setup Utility.

3D : 1 Initialize Keyboard.
2 Install PS2 mouse.

3E : Try to turn on Level 2 cache.
Note : Some chipset may need to turn on the L2 cache in this stage. But usually, the cache is turn on later in POST 61h.

BF : 1. Program the rest of the Chipset‘s value according to Setup. (Later Setup Value Program).
2. If auto-configuration is enabled, programmed the chipset with pre-defined value in the MODBINable Auto-Table.

41 : Initialize floppy disk drive controller.

42 : Initialize Hard drive controller.

43 : If it is a PnP BIOS, initialize serial & parallel ports.

45 : Initialize math coprocessor.

4E : If there is any error detected (such as video, kb....), show all the error messages the screen & wait for user to press <F1> key.

4F : 1. If password is needed, ask for password.
2. Clear the Energy Star Logo (Green BIOS only).

50 : Write all CMOS values currently in the BIOS stack area back into the CMOS.

52 : 1.Initialize all ISA ROMs.
2. Later PCI initializations (PCI BIOS only).
-assign IRQ to PCI devices.
-initialize all PCI ROMs.
3.PnP Initializations (PnP BIOS only).
-assign I/O, Memory, IRQ & DMA TO PnP ISA devices.
-initialize all PnP ISA ROMs.
4. Program shadows RAM according to Setup settings.
5. Program parity according to Setup setting.
6. Power Management Initialization.
-Enable/Disable global PM.
-APM interface initialization.

53 : 1.If it is NOT a PnP BIOS, initialize serial & parallel ports.
2. Initialize time value in BIOS data area by translate the RTC time value into a timer tick value.

60 : Setup Virus Protection (Boot Sector Protection) functionality according to Setup setting.

61 : 1. Try to turn on Level 2 cache.
Note : if L2 cache is already turned on in POST 3D, this part will be skipped.
2. Set the boot up speed according to Setup setting.
3. Last chance for Chipset initialization.
4. Last chance for Power Management initialization (Green BIOS only).
5. Show the system configuration table.

62 : 1.Setup daylight saving according to Setup value.
2.Program the NumLock, typematic rate & typematic speed according to Setup setting.

63 : 1. If there is any changes in the hardware configuration, update the ESCD information (PnP BIOS only).
2. Clear memory that have been used.
3. Boot system via INT 19H.

FF : System Booting. this means that the BIOS already pass the control right to the operating system.

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