Peak 630A series

Single Board Computer

User's Guide

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Table of Contents

How to use this guide

This manual is written to help you use Peak 630A. The manual describes how to arrange various settings on the Pentium II CPU board to meet your requirements. It's briefed as follows:

Chapter 1, "Introduction" gives an overview of the product's specifications. It also tells you what are included in the product package.

Chapter 2, "Switches and Connectors" describes the definitions and positions of Switches and Connectors that you may easily configure and set up per your requirement.

Chapter 3, "Capability Expanding" describes how to change or expand the CPU Board by changing the system memory, cache memory, and CPU to get more power out from the CPU board.

Chapter 4, "Award BIOS Setup" describes how to use the advanced PCI/Green BIOS to control almost every feature of the Peak 630A, including the on board SCSI and watchdog timer.

The Appendix 1 describes how to set up the Watch Dog Timer (WDT) and gives an example to program the WDT.

The Appendix 2 describes the memory mapping of the PEAK630A for user's reference in add-on card or programming.

Chapter 1

Introduction

Welcome to the PEAK-630A Pentium II single board computer.

The PEAK 630A is a brand new generation of advanced technologies. It's built with high performance Pentium II CPU with 100 MHz Slot 1 Bus, high performance PCI Bus and I/O's, huge memory support (1GB), and complied with the new PICMG standard. Further more, this is the first Pentium II SBC designed with all advanced features in one SBC. It's excellent to the system integrators, VARs, or turnkey vendor demanding high performance computing, high performance I/O, high data availability, and great system expandability.

The PEAK-630A can run with Intel Pentium II processor up to 450 MHz, memory support up to 1GB SDRAM. This generates great computing power. The on board enhanced PCI IDE interface can support up to mode 4 PIO and Mode 2 DMA master as well as the Ultra DMA 33. The on board Adaptec's AIC 7890 is the Brand new high performance PCI SCSI master with ultra, ultra wide and ultra 2 SCSI interfaces, providing very high value at a reasonable cost.

The Ultra 2 SCSI now supports 80MB/s data rate, it also extends the SCSI cable as long as 12 meters long. The new C&T 69000 VGA Controller with 2MB embedded SDRAM could supports both CRT and Panel displays. The Intel single chip 82558 Ethernet Controller supports 10 Base T/ 100 Base TX, full Duplex. To support these high performance on board PCI Device, the Intel 21152 PCI Bridge Controller is used. So the peak 630A is an all-in-one, single board server.

The SMC 37C932 integrates the floppy controller, two serial ports, one parallel port, and keyboard/mouse controller. The two on-chip UARTs are compatible with NS 16C550, and the parallel port support EPP/ECP.

The PICMG standard makes the PEAK 630A work with the legacy ISA back plane and brand new PCI back plane. The system monitoring features like the voltage levels, the FAN speeds, and the temperatures could be shown on screen,

then monitored by the system manager. The flash ROM is used to make the BIOS update easier, the additional keyboard connector is reserved for connecting to the keyboard connector on the back plane. The Universal Serial Bus (USB) is also supported by this product for flexible connections. The high precision real time clock/calendar is built in for accurate scheduling and the watchdog timer is also the standard feature.

The PEAK 630A is a highly integrated design with six optional models as follows.

model / Features	Peak 630	Peak 630V	Peak 630VL	Peak 630VS	Peak 630SL	Peak 630A
Common Features	V	V	V	V	V	V
Ultra 2 SCSI				V	V	V
VGA		V	V	V		V
LAN			V		V	V

1-1 Specifications

- **System architecture**
  Intel Brand New SLOT 1 CPU architecture,100 MHz external BUS
  Support Pentium II, all in one with VGA, 100 Base TX, Ultra 2 SCSI.
  PCI V2.1 complied
  PICMG 2.0 complied
  Full size SBC with ISA/PCI Gold finger

- **CPU support**
  Intel Pentium II up to 450 MHz
  Brand New Slot 1 CPU Bus running at 66/100 MHz

- **Cache memory**
  512KB Level 2 cache (pipeline burst SRAM) on Pentium II module
  No more cache memory on Board.
  Level 2 Cache ECC

- **Main memory**
  Only support SDRAM
  64Mb SDRAM support
  8MB up to 1GB (Max.)
  168pin DIMM socket x 4
  ECC support (single bit error correction/ multiple bit errors reporting)

- **BIOS**
  Award System BIOS with PC'97 support
  2M bit flash ROM
  C&T VGA BIOS
  Adaptec SCSI BIOS
  Intel LAN BIOS

- **Chipset**
  Intel 82440BX PCI set
  2nd generation P II Chip Set with MMX support
  Fully comply with PC'97
  PCI V2.1 Concurrent PCI
  Optimized SDRAM support

- **VGA**
  C&T 69000 VGA controller
  2MB SDRAM embedded.
  CRT & Panel support.

Max. Res.	Color	Refresh rate
800 x 600	true color	85 Hz
1024x768	64K color	85Hz
1280x1024	256 color	60Hz

Panel: <u>Support Single-Panel, Single-Driver</u>(SS), <u>Dual-Panel, Dual-Driver</u>(DD)
STN, TFT/MIM LCD and EL panel
Drivers Support: window 95/98,Window NT 4.0/5.0

- **SCSI**
  Adaptec AIC 7890 RISC SCSI Controller
  Brand New Ultra 2 SCSI support.
  80MB/S (max.) transfer rate, 12 meter cable support
  Backward compatible with Ultra Wide SCSI, SCSI II, etc.
  Driver support windows95/98, windows NT 4.0/5.0, Netware, SCO Open
  Server 5.0

- **LAN**
  Intel 82558 Single Chip Ethernet Controller
  10 Base T/100 Base TX support, full Duplex.
  Complied with PCI V2.1, IEEE 802.3, IEEE 802.3U
  Backward compatible with former 82557 Ethernet controller based net modules.
  Driver support:
  Dos/Windows, Netware, Windows95/98, Windows NT 4.0/5.0, SCO Open
  Server 5.0

- **On Board I/O**
  SMC 37C932 Super I/O ON BOARD
  SIOx2, with 2x16C550 UARTs, 9 pin D-type x 1, 10 Pin connector x 1
  PIOx1, Bi-directional, EPP/ECP support, 26 pin connector x 1
  Floppy Disk controller: 5 1/4" 360K/1.2MB, 3 1/2" 720K/1.2MB/1.44MB/2.88MB
  support, 34 pin connector x 1
  PCI IDE Hard Disk Interfaces: Support up to four enhanced IDE devices up to mode
  4 PIO and mode 2 DMA master, also support Ultra
  DMA 33.
  On chip Keyboard, mouse controller
  PS/2 Keyboard, 6 pin mini DIN x 1, pin header x 1 for 630, 630V, 630VS
  (Optional: PS/2, 6 pin min DIN x1 for keyboard/mouse only for 630A, 630VL, and
  630SL)
  PS/2 mouse, 6 pin mini DIN x 1for 630, 630V, 630VS
  On Board buzzer x 1
  On board USB port x 2 with 6 pin header x1
  On Board 2 pin header for reset sw, 4 pin for speaker, 5 pin for keylock
  5 pin header (keyboard)

- **On Board RTC**
  High precision clock/calendar with battery back up

- **On Board solid state Disk**
  Socket reserved for M-systems' DiskOnChip (DOC)
  Memory size up to 72MB single chip
  Drivers support DOS, Windows, Win 95 and NT (Bootable)

- **System monitor feature**
  Four voltage values (For +5V, +12V, +3.3V and Vcore)
  One Fan speed (For CPU)
  One temperature
  All values shown on screen (under Windows95, Windows NT 4.0)

- **Watchdog timer**
  .1, 2, 4, 8, 16, 32, 64 second time-out interval

- **Dimensions**
  Dimensions: 338mm(D) x 122mm(W)

- **Power requirements**
  +5V: 16A(Max)
  +/-12V: 20mA(Max)

- **Environments**
  Operating temperatures: 0°C to 60°C
  Storage temperatures: -20°C to 80°C
  Relative humidity: 10% to 90% (Non-condensing)

1-2 What you'll have from the package

In addition to this manual, the PEAK-630A package includes the following items

- PEAK 630A series single board computer x 1
- SIO+PIO cable x1
- FDC cable x 1
- IDE cable x 1
- 5 pin to 5 pin keyboard cable x 1 (for DIN keyboard connector)
- PS/2 cable with 2 outlets for keyboard and mouse (only PEAK 630A/ 630VL/630SL)
- Wide SCSI cable x 1 (only PEAK 630VS/630SL/630A)
- Adaptec SCSI Drivers Diskettes x 4 (only PEAK 630VS/630SL/630A)
- VGA Driver diskette x 1 (all models except 630/630SL)
- LAN Driver diskette x 1 (only PEAK 630VL/630SL/630A)
- System Monitor Driver diskette x2

If any of these items is missed or damaged, please contact your vendor for what you want.

Chapter 2

Switches and Connectors

This chapter gives the definitions and shows where to locate the positions of switches and connectors.

2-1 Switches

Switches on the CPU board are used to select options for different functions used. The switch-on or off is to accommodate the variations of the following table.
 (see figure 2-1 for switch positions)
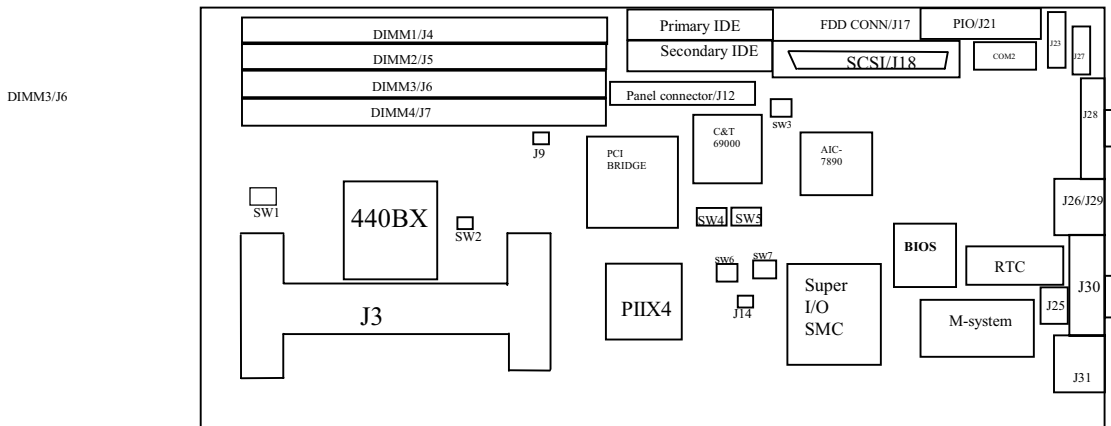
Figure 2-1 Switches Positions

Switch Setting

Pipeline	*Enable	Disable
SW1: 4	Off	On

RTC-Clear	RTC CLR enable	RTC CLR disable *
SW2: 2	on	off

CPU Base Clock	66 MHz	*100 MHz
SW2: 3	on	off
4	on	off

SW3	PCLK TO J12 Conn.	M to J12*
1	on	off
2	off	on

Core/Bus Ratio	2X	2.5X	3X	3.5X*	4X	4.5X	5X
SW4: 1	on	on	on	on	off	off	off
2	on	on	off	off	on	on	off
3	on	off	on	off	on	off	on
4	on	on	on	on	on	on	on

SW5

Panel 1	Panel Type	1	2	3	4
1	1024x768 Dual Scan STN Color Panel	on	on	on	on
2	1280x1024 TFT Color Panel	off	on	on	on
3	640x480 Dual Scan STN Color Panel	on	off	on	on
4	800x600 Dual Scan STN Color Panel	off	off	on	on
5	640x480 Sharp TFT Color Panel	on	on	off	on
6	640x480 18-bit TFT Color Panel	off	on	off	on
7	1024x768 TFT Color Panel	on	off	off	on
8	800x600 TFT Color Panel	off	off	off	on
9	800x600 TFT Color Panel (Large BIOS only)	on	on	on	off
10	800x600 TFT Color Panel (Large BIOS only)	off	on	on	off
11	800x600 Dual Scan STN Color Panel (Large BIOS only)	on	off	on	off
12	800x600 Dual Scan STN Color Panel (Large BIOS only)	off	off	on	off
13	1024x768 TFT Color Panel (Large BIOS only)	on	on	off	off
14	1280x1024 Dual Scan STN Color Panel (Large BIOS only)	off	on	off	off
15	1024x600 Dual Scan STN Color Panel (Large BIOS only)	on	off	off	off
16	1024x600 TFT Color Panel (Large BIOS only)	off	off	off	off

SW6:BIOS Size	1M	2M*
3	on	off
4	off	on

- M-SYSTEM

SW7:	Disable*	C000	C800	D000	D800
1	off	on	on	on	on
2	x	on	on	off	off
3	x	on	off	on	off

- BIOS Refresh

SW7:	Enable	Disable*
4	on	Off

2-2 Connectors

Connectors on the CPU Board provide interfaces to other devices.
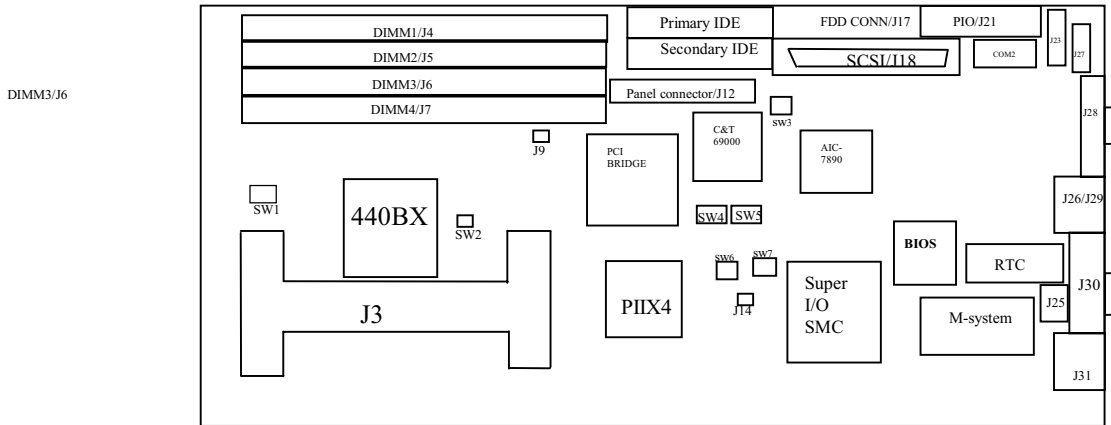
Figure 2-2 Connector positions

Connector	Function	Remark
J1	CPU Temperature sensor pin	
J3	CPU slot 1	
J4	DIMM	
J5	DIMM	
J6	DIMM	
J7	DIMM	
J9	FAN Conn.	
J10	IDE	
J11	IDE	
J12	Panel Conn.	
J14	Reset	
J16	IDE LED	
J17	Floppy	
J18	SCSI Conn.	
J20	Speaker	
J21	PIO	
J22	COM2	
J23	USB	
J24	Wake-up Lan	
J25	Key-lock	
J26	RJ45 (Lan Conn.)	
J27	Keyboard	

J28	CRT	
J29	Mouse PS/2	
J30	COM 1	
J31	Keyboard PS/2	

Pin definitions of connectors

- J9: CPU Fan Power Connector

PIN No.	Description
1	GND
2	+12V
3	Sense

- PANEL Connector (J12)

1	ENABKL	2	+12V SAFE
3	LP	4	DE
5	SHFCLK	6	FLM
7	PO	8	VDDSAFE
9	P2	10	P1
11	P4	12	P3
13	P6	14	P5
15	P8	16	P7
17	P10	18	P9
19	P12	20	VDDSAFE
2	P14	22	P11
23	GND	24	P13
25	P16	26	P15
27	P18	28	P17
29	P20	30	ENAVEE
31	P22	32	P19
33	GND	34	P21
35	P24	36	P23
37	P26	38	P25
39	M/PCLK	40	GND
41	P28	42	P27
43	P30	44	P29
45	P32	46	P31
47	P34	48	P33
49	GND	50	P35

- J16: IDE LED Connector

PIN No.	Description

1	+5V
2	HDD Active #

- J10 /J11: IDE Interface Connector

PIN No.	Description	PIN No.	Description
1	Reset#	2	Ground
3	Data 7	4	Data 8
5	Data 6	6	Data 9
7	Data 5	8	Data 10
9	Data 4	10	Data 11
11	Data 3	12	Data 12
13	Data 2	14	Data 13
15	Data 1	16	Data 14
17	Data 0	18	Data 15
19	Ground	20	N/C
21	DMA REQ	22	Ground
23	IOW#	24	Ground
25	IOR#	26	Ground
27	IOCHRDY	28	N/C
29	DMA ACK	30	Ground
31	Interrupt	32	IOCS16#
33	SA1	34	N/C
35	SA0	36	SA2
37	HDC CS0#	38	HDC CS1#
39	HDD Active#	40	Ground

- J14: Reset

PIN No.	Description
1	Reset
2	Ground

- J17: FDC Connector

PIN No.	Description	PIN No.	Description
1	Ground	2	Density Select
3	Ground	4	N/C
5	Ground	6	N/C
7	Ground	8	Index#
9	Ground	10	Motor Enable A#
11	Ground	12	Drive Select B#
13	Ground	14	Drive Select A#
15	Ground	16	Motor Enable B#
17	Ground	18	Direction#

19	Ground	20	Step#
21	Ground	22	Write Data#
23	Ground	24	Write Gate#
25	Ground	26	Track 0#
27	Ground	28	Write Protect#
29	N/C	30	Read Data#
31	Ground	32	Head Side Select#
33	N/C	34	Disk Change#

• J20: Speaker

PIN No.	Description
1	Speaker Signal
2	GND
3	GND
4	+5V

• J21: Parallel Port Connector

PIN No.	Description	PIN No.	Description
1	Strobe#	2	Data 0
3	Data 1	4	Data 2
5	Data 3	6	Data 4
7	Data 5	8	Data 6
9	Data 7	10	Acknowledge
11	Busy	12	Paper Empty
13	Printer Select	14	Auto Form Feed#
15	Error#	16	Initialize
17	Printer Select IN#	18	Ground
19	Ground	20	Ground
21	Ground	22	Ground
23	Ground	24	Ground
25	Ground	26	GND

• J23: USB connector

PIN No.	Description
1	VCC
2	SBD0-
3	SBD0+
4	SBD1-
5	SBD1+
6	Ground

• J24 Wake up (for 630VL, 630SL, 630A)(for ATX power)

1	5VSB
2	5VSB
3	Wake-up-
4	Button-In
5	GND

- J25: Keylock

PIN No.	Description
1	+5V
2	N/C
3	Ground
4	Keylock
5	Ground

- J26: LAN connector (for 630VL, 630SL, 630A)

PIN No.	Description
1	TD+
2	TD-
3	RD+
4	TERMPLANE
5	TERMPLANE
6	RD-
7	TERMPLANE
8	TERMPLANE
9	NC
10	NC
11	GND
12	GND

- J27:   Keyboard Connector

PIN No.	Description
1	Keyboard Clock
2	Keyboard Data
3	N/C
4	Ground
5	+5V

- J22/J30: Serial Port Connector (D-Sub 9 -pin)

PIN No.	Description
1	Data Carrier Detect (DCD)

2	Receive Data (RXD)
3	Transmit Data (TXD)
4	Data Terminal Ready (DTR)
5	Ground (GND)
6	Data Set Ready (DSR)
7	Request to Send (RTS)
8	Clear to Send (CTS)
9	Ring Indicator (RI)

- J28: CRT connector

PIN No.	Description
1	RED
2	Green
3	Blue
4	NC
5	GND
6	GND
7	GND
8	GND
9	+5
10	GND
11	NC
12	Display Data channel data
13	Horizontal Sync
14	Vertical Sync
15	Display Data Channel CLK

- J29: Mouse connector

PIN No.	Description
1	Mouse Data
2	N/C
3	Ground
4	+5V
5	Mouse Clock
6	N/C

- J31: PS/2 Keyboard/Mouse connector

PIN No.	Description
1	Keyboard DATA
2	Mouse DATA (for 630A,630VL, 630SL)

3	Gnd
4	+5V
5	Keyboard CLK
6	NC/Mouse CLK(for 630A, 630VL, 630SL)

Chapter 3

Capability Expanding

This chapter explains how you can expand capability of your CPU board in such aspects as system memory, cache memory, and CPU.

3-1 System Memory

Your system memory is provided by DIMM's (Dual In-line Memory Modules) on the CPU board. The CPU board contains four memory banks: Bank 0, 1, 2, 3, corresponds to connector DIMM1, DIMM2, DIMM3 and DIMM4.

The table below shows possible DIMM configurations for the memory banks and the figure helps you correctly install the DIMM modules. See Figure 3-2 for memory bank's location.

You can also use the DIMM with parity check. The ECC (Error Checking and Correction) could be turned on if parity DIMMs are used. The ECC will correct one bit error and report two bit errors. Please be noted that the PEAK 630A only supports the SDRAM.

DIMM 1	DIMM 2	DIMM 3	DIMM 4	Total Memory
16M	16M	Empty	Empty	32MB
32M	Empty	Empty	Empty	32MB
32M	16M	Empty	Empty	48MB
16M	16M	16M	Empty	48MB
16M	16M	16M	16M	64MB
32M	32M	Empty	Empty	64MB
32M	16M	16M	Empty	64MB
64M	Empty	Empty	Empty	64MB
32M	32M	32M	Empty	96MB
64M	32M	Empty	Empty	96MB
64M	64M	Empty	Empty	128MB
32M	32M	32M	32M	128MB
64M	64M	64M	Empty	192MB
64M	64M	32M	32M	192MB
64M	64M	64M	64M	256MB
128M	Empty	Empty	Empty	128M
128M	128M	Empty	Empty	256M

128M	128M	128M	Empty	384M
128M	128M	128M	128M	512M

Installing DIMM

To install the DIMM's, first make sure the two handles of the DIMM socket are in the "open" position, i.e. the handles stay outward. Slowly slide the DIMM modules along the plastic guides in the both ends of the socket. Then press the DIMM module down right into the socket, until a click is heard. That means the two handles automatically locked the memory modules into the right position of the DIMM socket as Figure 3-1 shows. To take away the memory module, just push the both handles outward, the memory module will be ejected by the mechanism in the socket.

Figure 3-1 Installing DIMM
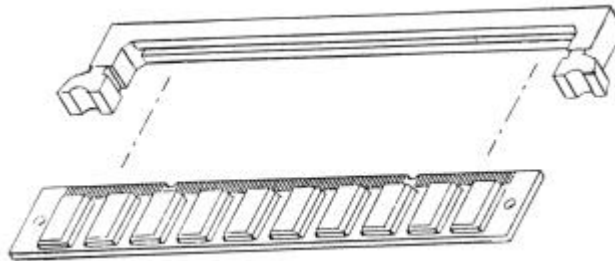
3-2 Cache Memory

Since the second level cache has been embedded into the Pentium II CPU. You do not have to take care of either SRAM chips or SRAM modules. The built-in second level cache in the Pentium II yields much higher performance than the external ones. The cache size in the Pentium II CPU is either 256KB or 512KB. Normally, for workstation and server applications, the 256KB version is good enough. However, if your system is for heavy-duty applications, the 512kB version will help a lot. Specifically for our Pentium II based SBC, the Pentium II has another version provide much better data security if combined with the DRAM ECC, please check with your vendor for various Pentium II models.

Figure 3-2 Memory Bank's Location
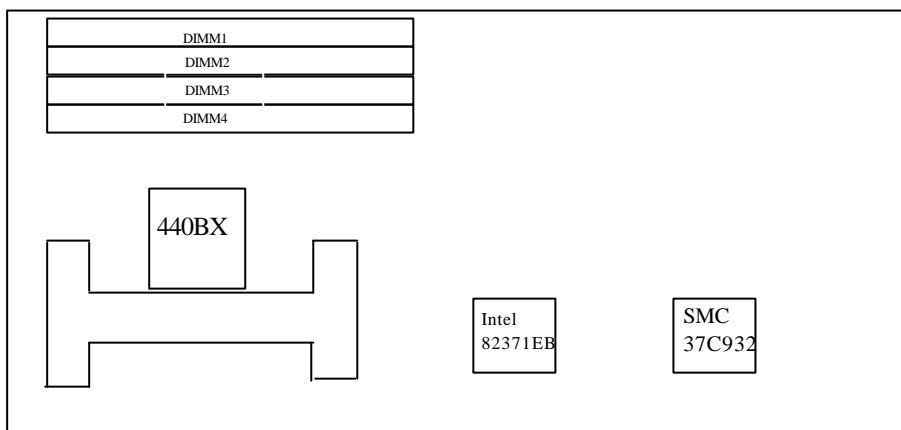
3-3 Mount-Change the CPU

The Pentium II is a module type CPU and running in high speed, e.g. 233MHz till 400MHz, or even higher, so the cooling mechanism becomes critical to the system reliability. There is only one type of cooling approach with a cooling fan attached to the heat sink of the Pentium II module. This is the choice for the PEAK630A because the space is limited for higher Heat Sinks.

A so-called "retention module" is used to firmly fix the Pentium II CPU to the slot1.

Put the retention module in line with the four holes around the slot 1, and the slot 1 will be enclosed by the retention module, then put the two screw sets from under the system board, make sure the screws get through the holes. The nuts are already in the retention module, use any screwdriver (flat type or cross type). You can easily fix the retention module on board.

Now you can put the Pentium II CPU module into the slot 1 and it will be firmly held by the retention module, again two clicks will be heard if the CPU module is put in the right position. (Enclosed drawing is on page 3-5)

Figure 3-3 Mount-Change the CPU
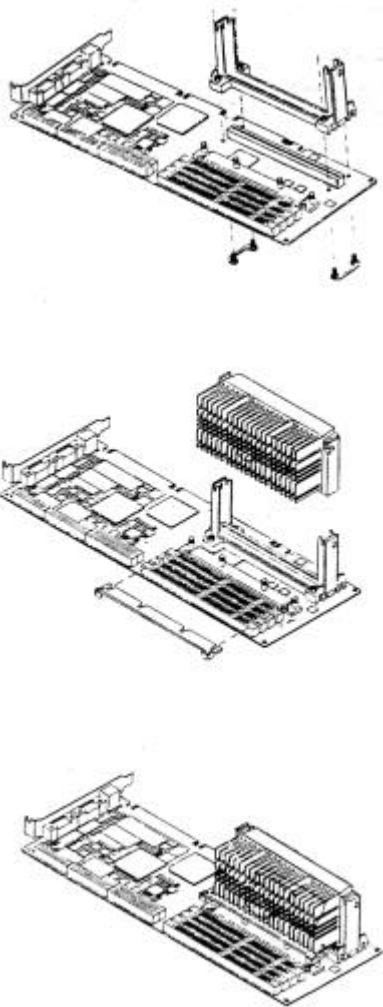
Chapter 4
AWARD BIOS Setup

Award's BIOS ROM has a built-in Setup program that allows users to modify the basic system configuration. This type of information is stored in battery-backed RAM (CMOS RAM) so that it retains the Setup information when the power is turned off.

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

If the message disappears before you respond and you still wish to enter Setup, restart the system to try again by turning it OFF then ON or pressing the "RESET" button on the system case. You may also restart by simultaneously pressing <Ctrl>, <Alt>, and <Delete> keys. If you do not press the keys at the correct time and the system does not boot, an error message will be displayed and you will again be asked to,

> PRESS <F1> TO CONTINUE, <CTRL-ALT-ESC> OR <DEL> TO ENTER SETUP

Control Keys

Up arrow	Move to previous item
Down arrow	Move to next item
Left arrow	Move to the item in the left hand
Right arrow	Move to the item in the right hand
Esc key	Main Menu -- Quit and not save changes into CMOS Status Page Setup Menu and Option Page Setup Menu -- Exit current page and return to Main Menu
PgUp / "+" key	Increase the numeric value or make changes
PgDn / "−" key	Decrease the numeric value or make changes
F1 key	General help, only for Status Page Setup Menu and Option Page Setup Menu
(Shift)F2 key	Change color from total 16 colors. F2 to select color forward, (Shift) F2 to select color backward
F3 key	Reserved
F4 key	Reserved
F5 key	Restore the previous CMOS value from CMOS, only for Option Page Setup Menu
F6 key	Load the default CMOS value from BIOS default table, only for Option Page Setup Menu
F7 key	Load the Setup default , only for Option Page Setup Menu
F8 key	Reserved
F9 key	Reserved
F10 key	Save all the CMOS changes, only for Main Menu

Getting Help

Main Menu

The on-line description of the highlighted setup function is displayed at the bottom of the screen.

Status Page Setup Menu/Option Page Setup Menu

Press F1 to pop up a small help window that describes the appropriate keys to use and the possible selections for the highlighted item. To exit the Help Window press <F1> or <Esc>.

The Main Menu

Once you enter Award BIOS CMOS Setup Utility, the Main Menu (Figure 1) will appear on the screen. The Main Menu allows you to select from ten setup functions and two exit choices. Use arrow keys to select among the items and press <Enter> to accept or enter the sub-menu.

ROM PCI/ISA BIOS (2A69KN0A)
CMOS SETUP UTILITY
AWARD SOFTWARE, INC.

STANDARD CMOS SETUP	INTEGRATED PERIPHERALS
BIOS FEATURES SETUP	SUPERVISOR PASSORD
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...	

Standard CMOS Setup

This setup page includes all the items in a standard compatible BIOS. See Page 4-7 to Page 4-10 for details.

BIOS Features Setup

This setup page includes all the items of Award special enhanced features. See Page 4-11 to Page 4-15 for details.

Chipset features setup

This setup page includes all the items of chipset special features. See Page 4-16 to 4-18 for details.

Power Management setup

This category d etermines how much power consumption for system after selecting below items. Default value is Disable. See Page 4-19 to Page 4-22 for details.

PNP/PCI Configuration

This category specifies the assignment of all the IRQ's and DMA's
See Page 4-23 to Page 4-24 for details.

Load BIOS defaults

BIOS defaults indicates the most appropriate value of the system parameter which the system would be in minimum performance. The OEM manufacturer may change the defaults through MODBIN before the binary image burn into the ROM.

Load setup defaults

Chipset defaults indicates the values required by the system for the maximum performance. The OEM manufacturer may change to defaults through MODBIN before the binary image burn into the ROM.

Integrated Peripherals

This category allows you to set up all the on board I/O controllers like IDE, SCSI, FDC, etc,. See Page 4-25 to Page 4-27

Supervisor/User Password

Change, set, or disable password of supervisor or user. It allows you to limit access to the system and Setup, or just to Setup. See Page 4-28 for details.

IDE HDD auto detection

Automatically configure hard disk parameters. See Page 4-29 to Page 4-32 for details.

Save & exit setup

Save CMOS value changes to CMOS and exit setup.

Exit without save

Abandon all CMOS value changes and exit setup.

Standard CMOS Setup Menu

The items in Standard CMOS Setup Menu are divided into 10 categories. Each category includes no, one or more than one setup items. Use the arrow keys to highlight the item and then use the <PgUp> or <PgDn> keys to select the value you want in each item.

ROM PCI/ISA BIOS (2A69KN0A)
STANDARD CMOS SETUP
AWARD SOFTWARE， INC.

```
Date (mm:dd:yy) : Fri, Apr 7 1995
Time (hh:mm:ss)  : 00:00:00

HARD DISKS        TYPE  SIZE  CYLS  HEAD  PRECOMP  LANDE  SECTOR  MODE
Primary Master    :  Auto   0     0     0       0         0       0      AUTO
Primary  Slave    :  Auto   0     0     0       0         0       0      AUTO
Secondary Master  :  Auto   0     0     0       0         0       0      AUTO
Secondary Slave   :  Auto   0     0     0       0         0       0      AUTO

Drive A : 1.44M , 3.5 in.
Drive B : None                          Base Memory :   640K
Floppy 3 Mode Support : Disabled        Extended Memory : 15360K

LCD&CRT : Both                          Other Memory :   384K

Halt On : All Errors                    Total Memory : 16384K

  ESC : Quit          ↑ ↓ → ← : Select Item      PU / PD / + / - : Modify
   F1   : Help              (Shift) F2 : Change Color
```

Date

The date format is <day>, <date> <month> <year>. Press <F3> to show the calendar.

day	The day of week, from Sun to Sat, determined by the BIOS, is read only
date	The date, from 1 to 31 (or the maximum allowed in the month), can key in the numerical / function key
month	The month, Jan through Dec
year	The year, depend on the year of BIOS

Time

The time format is <hour> <minute> <second>. which accepts both function key or numerical key The time is calculated based on the 24-hour military-time clock. For example, 1 p.m. is 13:00:00.

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".

CYLS.	number of cylinders
HEADS	number of heads
PRECOMP	write precom
LANDZONE	landing zone
SECTORS	number of sectors
MODE	HDD access mode

If a hard disk has not been installed select NONE and press <Enter>.

Drive A type/Drive B type

The category identifies the types of floppy disk drive A or drive B that have been installed in the computer.

None	No floppy drive installed
360K, 5.25 in	5-1/4 inch PC-type standard drive; 360 kilobyte capacity
1.2M, 5.25 in	5-1/4 inch AT-type high-density drive; 1.2 megabyte capacity
720K, 3.5 in	3-1/2 inch double-sided drive; 720 kilobyte capacity
1.44M, 3.5 in	3-1/2 inch double-sided drive; 1.44 megabyte capacity
2.88M, 3.5 in	3-1/2 inch double-sided drive; 2.88 megabyte capacity

Floppy 3 Mode Support:

The category determines whether the floppy 3 mode support is enabled or not.

LCD&CRT:

On board VGA select display type.

Type	Function
CRT	Boot from CRT only
LCD	Boot on LCD only
BOTH	Boot both LCD and CRT
AUTO	Boot on CRT or LCD

Error halt

The category determines whether the computer will stop if an error is detected during power up.

No Errors	Whenever the BIOS detects a non-fatal error the system will be stopped and you will be prompted.
All Errors	The system boot will not be stopped for any error that may be detected.
All, But Keyboard	The system boot will not stop for a keyboard error; it will stop for all other errors.
All, But Diskette	The system boot will not stop for a disk error; it will stop for all other errors.
All, But Disk/Key	The system boot will not stop for a keyboard or disk error; it will stop for all other errors.

Memory

The category is display-only which is determined by POST (Power On Self Test) of the BIOS.

Base Memory

The POST of the BIOS will determine the amount of base (or conventional) memory installed in the system. The value of the base memory is typically 512K for systems with 512K memory installed on the motherboard, or 640K for systems with 640K or more memory installed on the motherboard.

Extended Memory

The BIOS determines how much extended memory is present during the POST. This is the amount of memory located above 1MB in the CPU's memory address map.

Other Memory

This refers to the memory located in the 640K to 1024K address space. This is memory that can be used for different applications. DOS uses this area to load device drivers to keep as much base memory free for application programs. Most use for this area is Shadow RAM.

Total Memory

System total memory is the sum of basic memory, extended memory, and other memory.

BIOS Features Setup Menu

ROM PCI/ISA BIOS (2A69KN0A)
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
CPU L2 Cache ECC Checking	: Enabled	D0000-D3FFF Shadow	: Disabled
Quick Power on self test	: Disabled	D4000-D7FFF Shadow	: Disabled
Boot From LAN First	: Disabled	D8000-DBFFF Shadow	: Disabled
Boot Sequence	: A,C,SCSI	DC000-DFFFF Shadow	: Disabled
Swap Floppy Drive	: Disabled		
Boot up Floppy Seek	: Enabled		
Boot up Numlock Status	: ON		
Gate A20 Option	: Fast		
Typematic Rate Setting	: Disabled		
Typematic Rate (Chars/Sec)	: 6	ESC : Quit	↑↓←→: Select Item
Typematic Delay (Msec)	: 250	F1 : Help	PU/PD/+/-:Modify
Security Option	: Setup	F5 : Old Values	(Shift) F2: Color
PCI/VGA Palette Snoop	: Disabled	F6 : Load BIOS Default	
OS Select For DRAM 64MB	: Non-OS2	F7 : Load Setup Default	

Virus Warning

This category flashes on the screen. During and after the system boots up, any attempt to write to the boot sector or partition table of the hard disk drive will halt the system and the following error message will appear, in the mean time, you can run an anti-virus program to locate the problem.

! WARNING !
Disk boot sector is to be modified
Type "Y" to accept write or "N" to abort write
Award Software, Inc.

Enabled	Activates automatically when the system boots up causing a warning message to appear when anything attempts to access the boot sector or hard disk partition table.
Disabled	No warning message to appear when anything attempts to access the boot sector or hard disk partition table.

Note: This function is available only for DOS and other OSes that do not trap INT13.

CPU Internal Cache/External Cache

These two categories speed up memory access. However, it depends on CPU/chipset design. The default value is Enable. If your CPU without Internal Cache then this item "CPU Internal Cache" will not be show.

Enabled	Enable cache
Disabled	Disable cache

CPU L2 Cache ECC Checking

This category could turn on the ECC of Pentium II L 2 Cache or just disable it

Enabled	Enable L2 ECC
Disabled	Disable L2 ECC

Quick Power On Self Test

This category speeds 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.

Enabled	Enable quick POST
Disabled	Normal POST

Boot from LAN First

This category specifies whether System Boot through the LAN Boot ROM. If not, just disable it.

Enabled	Boot from LAN
Disabled	Not Boot from LAN

Boot Sequence

This category determines which drive computer searches first for the disk operating system (i.e., DOS). Default value is A,C.

A, C, SCSI	Default
C, A, SCSI	

C, CDROM, A	
CDROM, C, A	
D, A, SCSI	
E, A, SCSI	
F, A, SCSI	
SCSI, A, C	
SCSI, C, A	
C only	
LS/ZIP, C	

Swap Floppy Drive

This item allows you to determine whether enable the swap floppy drive or not.
The choice: Enabled/Disabled.

Boot Up Floppy Seek

During POST, BIOS will determine if the floppy disk drive installed is 40 or 80 tracks.
360K type is 40 tracks while 760K, 1.2M and 1.44M are all 80 tracks.

Enabled	BIOS searches for floppy disk drive to determine if it is 40 or 80 tracks. Note that BIOS can not tell from 720K, 1.2M or 1.44M drive type as they are all 80 tracks.
Disabled	BIOS will not search for the type of floppy disk drive by track number. Note that there will not be any warning messageif the drive installed is 360K.

Boot Up NumLock Status

The default value is On.

On	Keypad is number keys
Off	Keypad is arrow keys

Gate A20 Option

Normal	The A20 signal is controlled by keyboard controller or chipset hardware.
Fast	Default : Fast. The A20 signal is controlled by Port 92 or chipset specific method.

Typematic Rate Setting

This determines the typematic rate.

Enabled	Enable typematic rate and typematic delay programming

| Disabled | Disable typematic rate and typematic delay programming. The system BIOS will use default value of this 2 items and the default is controlled by keyboard. |

Typematic Rate (Chars/Sec)

6	6 characters per second
8	8 characters per second
10	10 characters per second
12	12 characters per second
15	15 characters per second
20	20 characters per second
24	24 characters per second
30	30 characters per second

Typematic Delay (Msec)

When holding a key, the time between the first and second character displayed.

250	250 msec
500	500 msec
750	750 msec
1000	1000 msec

Security Option

This category allows you to limit access to the system and Setup, or just to Setup.

System	The system will not boot and access to Setup will be denied if the correct password is not entered at the prompt.
Setup	The system will boot, but access to Setup will be denied if the correct password is not entered at the prompt.

Note: 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.

PCI/VGA Palette Snoop

Enable PCI controller support PCI/VGA palette snoop or not, if enabled, VGA cycle will transfer to ISA bus. If disabled, VGA cycle only transfer to PCI bus.

OS Select for DRAM 64MB

This segment is specifically created for OS/2 when DRAM is larger than 64MB. If your operating system is OS/2 and DRAM used is larger the 64MB, you have to select "OS 2", otherwise, non-OS2, default is NON-OS2.

Video BIOS Shadow

It determines whether video BIOS will be copied to RAM, however, it is optional from chipset design. Video Shadow will increase the video speed.

Enabled	Video shadow is enabled
Disabled	Video shadow is disabled

C8000 - CFFFF Shadow/D8000 - DFFFF Shadow

These categories determine whether optional ROM will be copied to RAM by 16K byte or 32K byte per/unit and the size depends on chipset.

Enabled	Optional shadow is enabled
Disabled	Optional shadow is disabled

Note: 1. for C8000-DFFFF option-ROM on PCI BIOS , BIOS will automatically enable the shadow RAM. User does not have to select the item.

2. IDE second channel control:
   Enable : enable secondary IDE port and BIOS will assign IRQ15 for this port.
   Disable: disable secondary IDE port and IRQ15 is available for other device. The item is optional only for PCI BIOS.

3. Some of the sound cards have an onboard CD-ROM controller which uses IDE Secondary Port. In order to avoid PCI IDE conflict, the IDE secondary channel control has to select "disable" then CD-ROM can work.

Chipset Features Setup Menu

Since the features in this section are related to the chipset in the CPU board and all are optimized, you are not recommended to change the default settings in the setup table, unless you know very detailed of the chipset features.

ROM PCI/ISA BIOS (2A69KN0A)
CHIPSET FEATURES SETUP
AWARD SOFTWARE, INC.

SDRAM RAS-to-CAS Delay	: 3	CPU Warning Temperature	: Disabled
SDRAM RAS Precharge Time	: 3	Current CPU Temperature	: 0 °C/32 °F
SDRAM CAS latency Time	: 2	Current CPUFAN Speed	: 0 RPM
SDRAM Precharge Control	: Disabled	Current vdd (v)	: 5V
DRAM Data Integrity Mode	: Non-ECC	Current vin1 (v)	: 3.3V
System BIOS Cacheable	: Disabled	Current vin2 (v)	: 3 V
Video BIOS Cacheable	: Disabled	Current vin3 (v)	: 2.0V
Video RAM Cacheable	: Disabled		
8 Bit I/O Recovery Time	: 1		
16 Bit I/O Recovery Time	: 1		
Memory Hole At 15M-16M	: Disabled		
Passive Release	: Enabled		
Delay Transaction	: Enabled	ESC: Quit	↑↓→←: Select item
AGP Aperture Size (MB)	: 4	F1 : Help	PU/PD/+/-: Modify
		F5 : Old Values	(Shift) F2: Color
		F6 : Load BIOS Defaults	
		F7 : Load Setup Defaults	

SDRAM RAS-to-CAS Delay

You can select RAS to CAS Delay time in HCLKs of 2/2 or 3/3. The system board designer should set the values in this field, depending on the DRAM installed. Do not change the values in this field unless you change specifications of the installed DRAM or the installed CPU. The Choice: 2, 3.

SDRAM RAS Precharge Time

Defines the length of time for Row Address Strobe is allowed to precharge. The Choice: 2, 3.

SDRAM CAS latency Time

You can select CAS latency time in HCLKs of 2/2 or 3/3. The system board designer should set the values in this field, depending on the DRAM installed. Do not change the values in this field unless you change specifications of the installed DRAM or the installed CPU.

SDRAM Precharge Control

DRAM Data Integrity Mode

Select Parity or ECC (ERROR-CORRECTING CODE), according to the type of installed DRAM.

System Bios Cacheable

Select Enabled allows caching of the system BIOS ROM at F000h-FFFFFh, resulting in better system performance. However, if any program writes to this memory area, a system error may result

Enabled	BIOS access cached
Disabled	BIOS access not cached

Video BIOS Cacheable

Select Enable allows caching of the video BIOS ROM AT C0000h-F7FFFh, resulting in better video performance. However, if any program writes to this memory area, a system error may result

Enabled	Video BIOS access cached
Disabled	Video BIOS access not cached

Video RAM Cacheable

Select Enabled allows caching of the video RAM, resulting in better system performance. However, if any program writes tothis memory area, a system error may result.

8 Bit I/O Recovery Time

The recovery time is the length of time, measured in CPU clocks, which the system will delay after the completion of an input/output request. This delay takes place because the CPU is operationg so much faster than the input/output bus that the CPU must be

delayed to allow for the completion of the I/O. This itm allows you to detemine the recovery time allowed for 8 bit I/O. Choices are from NA, 1 to 8 CPU clocks.

16 Bit I/O Recovery Time

This item allows you to determine the recovery time allowed for 16 bit I/O. Choices are from NA, 1 to 4 CPU clocks

Memory Hole At 15M-16M.

In order to improve performance, certain space in memory can be reserved for ISA cards.. This memory must be mapped into the memory space below 16 MB.

Enabled	Memory hole supported.
Disabled	Memory hole not supported

Passive Release

When Enabled, CPU to PCI bus accesses are allowed druing passive release. Othersiwe, the arbiter only accepts another PCI master access to local DRAM. The Choice: Enabled, Disabled.

Delay Transaction

The chipset has an embeded 32-bit posted write buffer to support delay transactions cycles.. Select Enabled to support compliance with PCI specification version 2.1

AGP Aperture Size (MB)

Select the size of the Accelerated Graphics Port (AGP) aperture. The aperture is a portion of the PCI memory address range dedicated for graphics memory address space. Host cycles that hit the aperture range are forwarded to the AGP without any translation. See www.agpforum.org for AGP information.
The choice: 4, 8, 16, 32, 64, 128, 256

CPU Warning Temperature

When the temperature is over the CPU warning temperature, then the warning signal will come out.

Current CPU Temperature

This field displays the current CPU of system temperature.

Current CPU FAN Speed

These fields display the current speed of up to two CPU fans.

Current voltage

These fields display the current voltge of up to four voltage.

Power Management Setup

The Power management setup will appear on your screen like this:

ROM PCI/ISA BIOS (2A69KN0A)
POWER MANAGEMENT SETUP
AWARD SOFTWARE, INC.

Power Management	: User Define	** Reload Global Timer Events **	
PM Control by APM	: Yes	IRQ[3-7, 9-15], NMI	: Enabled
Video Off Method	: V/H SYNC+Blank	Primary IDE 0	: Disabled
Video Off After	: Stand by	Primary IDE 1	: Disabled
MODEM Use IRQ	: 3	Secondary IDE 0	: Disabled
Doze Mode	: Disabled	Secondary IDE 1	: Disabled
Standby Mode	: Disabled	Floppy Disk	: Disabled
Suspend Mode	: Disabled	Serial Port	: Disabled
HDD Power Down	: Disabled	Parallel Port	: Disabled
Throttle Duty Cycle	: 62.5%		
PCI/VGA Act-Monitor	: Disabled		
PowerOn by Ring	: Disabled		
IRQ 8 Break Suspend	: Disabled		
		ESC: Quit	↑↓→←: Select item
		F1 : Help	PU/PD/+/-: Modify
		F5 : Old Values	(Shift) F2: Color
		F6 : Load BIOS Default	
		F7 : Load Setup Default	

Power Management

This category allows you to select the type (or degree) of power saving and is directly related to the following modes:

1. Doze Mode
2. Standby Mode
3. Suspend Mode
4. HDD Power Down

There are four selections for Power Management, three of which have fixed mode settings.

Disable (default)	No power management. Disables all four modes

Min. Power Saving	Minimum power management. Doze Mode = 1 hr. Standby Mode = 1 hr., Suspend Mode = 1 hr., and HDD Power Down = 15 min.
Max. Power Saving	Maximum power management -- **ONLY AVAILABLE FOR SL CPU'S**. Doze Mode = 1 min., Standby Mode = 1 min., Suspend Mode = 1 min., and HDD Power Down = 1 min.
User Define	Allows you to set each mode individually. When not disabled, each of the ranges are from 1 min. to 1 hr. except for HDD Power Down which ranges from 1 min. to 15 min. and disable.

PM Control by APM

When enabled, an Advanced Power Management device will be activated to enhance the Max. Power Saving mode and stop the CPU internal clock.

If the Max. Power Saving is not enabled, this will be preset to *No*.

Video Off Method

This determines the manner in which the monitor is blanked.

V/H SYNC+Blank	This selection will cause the system to turn off the vertical and horizontal synchronization ports and write blanks to the video buffer.
Blank Screen	This option only writes blanks to the video buffer.
DPMS	Initial display power management signaling.

Video Off After

When enabled, this feature allows the VGA adapter to operate in a power saving mode.

N/A	Monitor will remain on during power saving modes.
Suspend	Monitor blanked when the systems enters the Suspend mode.
Standby	Monitor blanked when the system enters Standby mode.
Doze	Monitor blanked when the system enters any power saving mode.

MODEM Use IRQ

Name the interrupt request (IRQ) line assigned to the modem (if any) on your system. Activity of the selected IRQ always awakens the system.

The choices: NA, 3, 4, 5, 7, 9, 10, 11

PM Timers

The following four modes are Green PC power saving functions which are only user configurable when *User Defined* Power Management has been selected. See above for available selections.

Doze Mode

When enabled and after the set time of system inactivity, the CPU clock will run at slower speed while all other devices still operate at full speed.

Standby Mode
When enabled and after the set time of system inactivity, the fixed disk drive and the video would be shut off while all other devices still operate at full speed.

Standby Mode

1. Disable	System will never enter STANDBY mode

2. 1 Min
    2 Min
    4 Min
    6 Min
    8 Min
   10 Min
   20 Min
   30 Min
   40 Min
    1 Hr
	Defines the continuous idle time before the system entering STANDBY mode.
	
	if any item defined in (J) is enabled & active, STANDBY timer will be reloaded

Suspend Mode
When enabled and after the set time of system inactivity, all devices except the CPU will be shut off.

HDD Power Down
When enabled and after the set time of system inactivity, the hard disk drive will be powered down while all other devices remain active.

Throttle Duty Cycle
When the system enters Doze mode, the CPU clock runs only part of the time.
You may select the percent of time that the clock runs.
The Choice: 12.5%, 25.0%, 37.5%, 50.0%, 62.5%, 75.0%

PCI/VGA Active Monitor
When Enabled, any video activity restarts the global timer for Standby mode.
The Choice: Enabled, Disabled.

PowerOn by Ring
An input signal on the serial Ring Indicator (RI) line (in other words, an incoming call on the modem) awakens the system from a soft off state..
The Choice: Enabled, Disabled.

IRQ 8 Break Suspend

You can Enable or Disable monitoring of IRQ8 so it does not awaken the system from Suspend mode. The Choice: Enabled, Disabled.

Reload Global Timer Events

When Enabled, an event occurring on each device listed below restarts the global time for Standby mode.

IRQ[3 -7, 9-15], NMI
Primary IDE 0
Primary IDE 1
Secondary IDE 0
Secondary IDE 1
Floppy Disk
Serial Port
Parallel Port

PnP/PCI Configuration

This section describes configuring the PCI bus system. PCI, or **P**eripheral **C**omponent **I**nterconnect, is a system which allows I/O devices to operate at speeds nearing the speed the CPU itself uses when communicating with its own special components. This section covers some very technical items and it is strongly recommended that only experienced users should make any changes to the default settings.

```
                    ROM PCI / ISA BIOS (2A69KN0A)
                       PNP/PCI CONFIGURATION
                       AWARD SOFTWARE, INC.
```

PNP OS Installed	: Yes	Used MEM base addr	: N/A
Resource Controlled By	: Manual	Assign IRQ for USB	: Disabled
Reset Configuration Data	: Disabled		
IRQ-3 assigned to	: PCI/ISA PnP		
IRQ-4 assigned to	: PCI/ISA PnP		
IRQ-5 assigned to	: PCI/ISA PnP		
IRQ-7 assigned to	: PCI/ISA PnP		
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	: PCI/ISA PnP		
IRQ-15 assigned to	: PCI/ISA PnP		
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 OS Installed

Select Yes if the system operating environment is Plug-and-Play aware (e.g.Windows 95). The Choice: Yes and No.

Resource Controlled by

The Award Plug and Play BIOS can automatically configure all the boot and Plug and Play-compatible devices. If you select Auto, all the interrupt request (IRQ) and DMA assignment fields disappear, as the BIOS automatically assigns them.
The choice: *Auto* and Manual.

Reset Configuration Data

Normally, you leave this field Disabled. Select Enabled to reset Extended System Configuration Data (ESCD) when you exit Setup if you have installed a new add-on and the system reconfiguration has caused such a serious conflict that the operating system cannot boot.
The choice: *Enabled* and *Disabled*.

IRQ n Assigned to

When resources are controlled manually, assign each system interrupt as one of the following types, depending on the type of device using the interrupt:
Legacy ISA Devices compliant with the original PC AT bus specification, requiring a specific interrupt (such as IRQ4 for serial port 1).
PCI/ISA PnP Devices compliant with the Plug and Play standard, whether designed for PCI or ISA bus architecture.
When resources are controlled manually, assign each system DMA channel as one of the following types, depending on the type of device using the interrupt:
Legacy ISA Devices compliant with the original PC AT bus specification, requiring a specific DMA channel
PCI/ISA PnP Devices compliant with the Plug and Play standard, whether designed for PCI or ISA bus architecture.

Used MEM base addr

Select a base address for the memory area used by any peripheral that requires high memory.
The Choice: C800, CC00, D000, D400, D800, DC00, N/A.

Assing IRQ For USB

Assing IRQ for USB : Enable
Not assign IRQ for USB : Disable

Integrated Peripherals

ROM PCI / ISA BIOS (2A69KN0A)
INTEGRATED PERIPHERALS
AWARD SOFTWARE, INC.

IDE HDD Block Mode	: Disabled	Parallel Port Mode	: +EPP1.9
IDE Primary Master PIO	: Auto	ECP Mode Use	: 3
		DMA	
IDE Primary Slave PIO	: Auto		
IDE Secondary Master PIO	: Auto		
IDE Secondary Slave PIO	: Auto		
IDE Primary Master UDMA	: Auto		
IDE Primary Slave UDMA	: Auto		
IDE Secondary Master UDMA	: Auto		
IDE Secondary Slave UDMA	: Auto		
On-Chip Primary PCI IDE	: Enabled		
On- Chip Secondary PCI IDE	: Enabled		
On board PCI SCSI Chip	: Enabled		
USB Keyboard Support	: Disabled		
Init Display First	: PCI Slot		
Onboard FDD Controller	: Enable		
Onboard Serial Port 1	: Auto	ESC : Quit	↑↓ → ←: Select Item

Onboard Serial Port 2	: Auto	F1 : Help	PU/PD/+/- : Modify
UART2 Mode	: Standard	F5 : Old Values	(Shift) F2 : Color
Onboard Parallel Port	: 3BC/IRQ7	F6 : Load BIOS Defaults	
		F7 : Load Setup Defaults	

IDE HDD Block Mode

This allows your hard disk controller to use the fast block mode to transfer data to and from your hard disk drive (HDD).

Enabled	IDE controller uses block mode.
Disabled	IDE controller uses standard mode.

IDE Primary/Secondary Master/Slave PIO

The four IDE PIO (Programmed Input/Output) fields let you set a PIO mode (0-4) for each of the four IDE devices that the onboard IDE interface supports. Modes 0 through 4 provide successively increased performance. In Auto mode, the system automatically determines the best mode for each device.

IDE Primary/Secondary Master/Slave UDMA

Ultra DMA/33 implementation is possible only if your IDE hard drive supports it and the operating environment includes a DMA driver (Windows 95 OSR2 or a third-party IDE bus master driver). If your hard drive and your system software both support Ultra DMA/33, select Auto to enable BIOS support.   The Choice: Auto, Disabled

On-Chip Primary/Secondary PCI IDE

The integrated peripheral controller contains an IDE interface with support for two IDE channels. Select Enabled to activate each channel separately.

Onboard PCI SCSI Chip

This item allows you to determine whether onboard PCI SCSI chip is enabled ot not.

USB Keyboard support

Select Enabled if your system contains a Universal Serial Bus (USB) controller and you have a USB keyboard.
The Choice: Enabled, Disabled.

Init Display First

For user to select to init AGP or PCI VGA first

Onboard FDD Controller

This should be enabled if your system has a floppy disk drive (FDD) installed on the system board and you wish to use it. Even when so equipped, if you add a higher performance controller, you will need to disable this feature.
The Choice: Enabled, Disabled.

Onboard Serial Port 1/Port 2

This item allows you to determine access onboard serial port 1/port 2 controller with which I/O address. The Choice: 3F8/IRQ4, 2F8/IRQ3, 3E8/IRQ4, 2F8/IRQ3, Disabled, Auto.

UART 2 Mode

This item allows you to determine which Infra Red (IR) function of onboard I/O chip.
The Choice: Standard, ASKIR, HPSIR.

Onboard Parallel Port

Select a logical LPT port name and matching address for the physical parallel
(printer) port. The choice: 378H/IRQ7, 278H/IRQ5, 3BCH/IRQ7, Disabled.

Parallel Port   Mode

Select an operating mode for the onboard parallel port. Select Compatible or Extended
unless you are certain both your hardware and software support EPP or ECP mode.
The choice: SPP, ECP+EPP1.7, EPP1.7+SPP, EPP1.9+SPP, ECP, ECP+EPP1.9, and Normal.

ECP Mode Use DMA

Select a DMA channel for the port.
Choices are 3, 1.

Supervisor/User Password Setting

You can set either supervisor or user password, or both of then. The differences between are:

supervisor password :   can enter and change the options of the setup menus.
user password   :   just can enter but do not have the right to change the
                              options of the setup menus.

When you select this function, 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 in length, 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 a password, just press <Enter> when you are prompted to enter the password. A message will confirm the password will be disabled. Once the password is disabled, the system will boot and you can enter Setup freely.

      PASSWORD DISABLED.

When a password has been enabled, you will be prompted to enter it every time you try to enter Setup. This prevents an unauthorized person from changing any part of your system configuration.

Additionally, when a password is enabled, you can also require the BIOS to request a password every time your system is rebooted. This would prevent unauthorized use of your computer.

You determine when the password is required within the BIOS Features Setup Menu and its Security option (see Section 4). If the Security option is set to "System", the password will be required both at boot and at entry to Setup. If set to "Setup", prompting only occurs when trying to enter Setup.

IDE HDD Auto Detection

The enhance IDE features was included in all Award BIOS. Below is a brief description of this feature.

    1. Setup Changes

    <I> Auto-detection

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

            if HDD does not support LBA modes, no ' LBA' option will be shown. Users can select a mode which is appropriate for them.

ROM/PCI/ISA BOPS (2XXXXXXX)
CMOS SETUP UTILITY
AWARD SOFTWARE, INC.

HARD DISKS	TYPE	SIZE	CYLS	HEAD	PRECOMP	LANDZ	SECTOR	MODE

Select Primary Master Option (N = Skip) : N

OPTION	SIZE	CYLS	HEADS	PRECOMP	LANDZONE	SECTORS	MODE
1(Y)	516	1120	16	65535		1119	59 NORMAL
2	516	524	32	0	1119	63	LBA

    <II> Standard CMOS Setup

		CYLS	Heads	Precomp	Landzone	Sector	Mode
Primary Master:	User (516MB)	1120	16	65535	1119	59	Normal
Primary Slave:	None (203MB)	684	16	65535	685	38	------
Secondary Master:	None	0	0	0	0	0	0

Secondary Slave	None	0	0	0	0	0	0

When HDD type is in 'user' type, the "MODE" option will be opened for user to select their own HDD mode.

2. HDD Modes

The Award BIOS supports 3 HDD modes : 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, head & sectors for NORMAL mode are 1024, 16 & 63.

no. Cyclinder	(1024)
x no. Head	(16)
x no. Sector	(63)
x no. per sector	(512)
	528 Megabytes

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, heads & sectors shown in setup may not be the number physically contained in he 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 Gigabytes which is obtained by the following formula:

no. Cyclinder	(1024)
x no. Head	(255)
x no. Sector	(63)
x bytes per sector	(512)
	8.4 Gigabytes

LARGE mode

Extended HDD access mode supported by Award Software.
Some IDE HDDs contain more than 1024 cylinder without LBA support (in some cases, user do not want LBA). The Award BIOS provides another alternative to support these kinds of HDD!

Example of LARGE mode:

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

BIOS tricks DOS (or other OS) that the number of cylinders 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 INT13h in order to access the right HDD address the right HDD address!

Maximum HDD size:

	no. Cyclinder	(1024)
x	no. Head	(32)
x	no. Sector	(63)
x	bytes per sector	(512)
	1 Gigabytes	

3. 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.

Hard Disk Low Level Format Utility

This Award Low-Level-Format Utility is designed as a tool to save your
time formatting your hard disk. The Utility automatically looks for the
necessary information of the drive you selected. The Utility also searches
for bad tracks and lists them for your reference.

Shown below is the Main Menu after you enter into the Award
Low-Level-Format Utility.

Hard Disk Low Level Format Utility

   SELECT DRIVE

   BAD TRACK LIST

   PREFORMAT

   Current select drive is: C

DRIVE: C CYLINDER: 0 HEAD : 0

NO. CYLS HEAD

		Size	Cyls	Head	Precomp	Landz	Sector	Mode
Primary Master	:	0	0	0	0	0	0	AUTO
Primary Slave	:	0	0	0	65535	65535	0	AUTO
Secondary Master	:	0	0	0	0	0	0	AUTO
Secondary Slave	:	0	0	0	0	65280	0	AUTO

   Up/Down - Select item   ENTER-Accept   ESC-Exit/Abort
   Copyright (C) Award Software, Inc. 1992-98 All Rights Reserved

Control Keys

Use the Up and Down arrow keys to move around the selections displayed

on the upper screen. Press [Enter] to accept the selection. Press Esc to abort the selection or exit the Utility.

Select Drive

Select from installed hard disk drive C or D. List at the bottom of the screen is the drive automatically detected by the utility.

Bad Track List

Auto scan bad track

The utility will automatically scan bad tracks and list the bad tracks in the window at the right side of the screen.

Add bad track

Directly type in the information of the known bad tracks in the window at the right side of the screen.

Modify bad track

Modify the information of the added bad tracks in the window at the right side of the screen.

Delete bad track

Delete the added bad tracks in the window at the right side of the screen.

Clear bad track table

Clear the whole bad track list in the window at the right side of the screen.

Preformat

Interleave

Select the interleave number of the hard disk drive you wish to perform low level format. You may select from 1 to 8. Check the documentation that came with the drive for the correct interleave number, or select 0 for utility automatic detection.

Auto scan bad track

This allows the utility to scan first then format by each track.

Start

Press <Y> to start low level format.

Power-On Boot

After you have made all the changes to CMOS values and the system cannot boot with the CMOS values selected in Setup, restart the system by turning it OFF then ON or Pressing the "RESET" button on the system case. You may also restart by simultaneously press <Ctrl>, <Alt>, and <Delete> keys. Upon restart the system, immediately press <Insert> to load BIOS default CMOS value for boot up.

BIOS Reference - POST Message

During the Power On Self Test (POST), if the BIOS detects an error requiring you to do something to fix, it will either sound a beep code or display a message.

If a message is displayed, it will be accompanied by:

PRESS F1 TO CONTINUE, CTRL-ALT-ESC OR DEL TO ENTER SETUP

POST Beep

Currently there is only one beep code in BIOS. This 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 two short beeps.

Error Messages

One or more of the following messages may be displayed if the BIOS detects an error during the POST. This list includes messages for both the ISA and the EISA BIOS.

CMOS BATTERY HAS FAILED

CMOS battery is no longer functional. It should be replaced.

CMOS CHECKSUM ERROR

Checksum of CMOS is incorrect. This can indicate that CMOS has become corrupt. This error may have been caused by a weak battery. Check the battery and replace if necessary.

DISK BOOT FAILURE, INSERT SYSTEM DISK AND PRESS ENTER

No boot device was found. This could mean that either a boot drive was not detected or the drive does not contain proper system boot files. Insert a system disk into Drive A: and press <Enter>. If you assumed the system would boot from the hard drive, make sure the controller is inserted correctly and all cables are properly attached. Also be sure the disk is formatted as a boot device. Then reboot the system.

DISKETTE DRIVES OR TYPES MISMATCH ERROR - RUN SETUP

Type of diskette drive installed in the system is different from the CMOS definition. Run Setup to reconfigure the drive type correctly.

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.

DISPLAY TYPE HAS CHANGED SINCE LAST BOOT

Since last powering off the system, the display adapter has been changed. You must configure the system for the new display type.

EISA Configuration Checksum Error
PLEASE RUN EISA CONFIGURATION UTILITY

The EISA non-volatile RAM checksum is incorrect or cannot correctly read the EISA slot. This can indicate either the EISA non-volatile memory has become corrupt or the slot has been configured incorrectly. Also be sure the card is installed firmly in the slot.

EISA Configuration Is Not Complete
PLEASE RUN EISA CONFIGURATION UTILITY

The slot configuration information stored in the EISA non-volatile memory is incomplete.

> Note: When either of these errors appear, the system will boot in ISA mode, which allows you to run the EISA Configuration Utility.

ERROR ENCOUNTERED INITIALIZING HARD DRIVE

Hard drive cannot be initialized. Be sure 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

Cannot initialize controller. Make sure the cord is correctly and firmly installed in the bus. Be sure the correct hard drive type is selected in Setup. Also check to see if any jumper needs to be set correctly on the hard drive.

FLOPPY DISK CNTRLR ERROR OR NO CNTRLR PRESENT

Cannot find or initialize the floppy drive controller. make sure the controller is installed correctly and firmly. If there are no floppy drives installed, be sure the Diskette Drive selection in Setup is set to NONE.

Invalid EISA Configuration
PLEASE RUN EISA CONFIGURATION UTILITY

The non-volatile memory containing EISA configuration information was programmed incorrectly or has become corrupt. Re-run EISA configuration utility to correctly program the memory.

> NOTE: When this error appears, the system will boot in ISA mode, which allows you to run the EISA Configuration Utility.

KEYBOARD ERROR OR NO KEYBOARD PRESENT

Cannot initialize the keyboard. Make sure the keyboard is attached correctly and no keys are being pressed during the boot.

If you are purposely configurating 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 at ...

Indicates a memory address error at a specific location. You can use this location along with the memory map for your system to find and replace the bad memory chips.

Memory parity Error at ...

Indicates a memory parity error at a specific location. 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 SINCE LAST BOOT

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

Memory Verify Error at ...

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 NOT FOUND

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

OFFENDING SEGMENT:

This message is used in conjunction with the I/O CHANNEL CHECK and RAM PARITY ERROR messages when the segment that has caused the problem has been isolated.

PRESS A KEY TO REBOOT

This will be displayed at the bottom screen when an error occurs that requires you to reboot. Press any key and the system will reboot.

PRESS F1 TO DISABLE NMI, F2 TO REBOOT

When BIOS detects a Non-maskable Interrupt condition during boot, this will allow you to disable the NMI and continue to boot, or you can reboot the system with the NMI enabled.

RAM PARITY ERROR - CHECKING FOR SEGMENT ...

Indicates a parity error in Random Access Memory.

Should Be Empty But EISA Board Found
PLEASE RUN EISA CONFIGURATION UTILITY

A valid board ID was found in a slot that was configured as having no board ID.

NOTE; When this error appears, the system will boot in ISA mode, which allows you to run the EISA Configuration Utility.

Should Have EISA Board But Not Found
PLEASE RUN EISA CONFIGURATION UTILITY

The board installed is not responding to the ID request, or no board ID has been found in the indicated slot.

NOTE: When this error appears, the system will boot in ISA mode, which allows you to run the EISA Configuration Utility.

Slot Not Empty

Indicates that a slot designated as empty by the EISA Configuration Utility actually contains a board.

NOTE: When this error appears, the system will boot in ISA mode, which allows you to run the EISA Configuration Utility.

SYSTEM HALTED, (CTRL-ALT-DEL) TO REBOOT ...

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.

Wrong Board In Slot
PLEASE RUN EISA CONFIGURATION UTILITY

The board ID does not match the ID stored in the EISA non-volatile memory.

NOTE: When this error appears, the system will boot in
ISA mode, which allows you to run the EISA Configuration
Utility.

BIOS Reference - POST Codes

Note: EISA POST codes are typically output to port address 300h.
ISA POST codes are output to port address 80h.

POST (hex)	Description

C0	1. Turn off OEM specific cache, shadow...
	2. Initialize all the standard devices with default values standard devices includes:
	    -DMA controller (8237)
	    -Programmable Interrupt Controller (8259)
	    -Programmable Interval Timer (8254)
	    -RTC chip

C1	Auto-detection of onboard DRAM & Cache
C3	1. Test system BIOS checksum 2. Test the first 256K DRAM 3. Expand the compressed codes into temporary DRAM area including the compressed System BIOS & Option ROMs
C5	Copy the BIOS from ROM into E0000-FFFFF shadow RAM so that POST will go faster
01-02	Reserved
03	Initialize EISA registers (EISA BIOS only)
04	Reserved
05	1. Keyboard Controller Self-Test 2. Enable Keyboard Interface
06	Reserved

07	Verifies CMOS's basic R/W functionality
BE	Program defaults values into chipset according to the MODBINable Chipset Default Table
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(Suprious) Interrupt Handler 2. Issue CPUID instruction to identify CPU type 3. Early Power Management initialization (OEM specific)

♀ **This POST code is for boot block**

POST (hex)	Description

C0	1. Turn off OEM specific cache, shadow...
	2. Initialize all the standard devices with default values standard devices includes:
	    -DMA controller (8237)
	    -Programmable Interrupt Controller (8259)
	    -Programmable Interval Timer (8254)
	    -RTC chip

C1	Auto-detection of onboard DRAM & Cache
C3	Checking checksum of compressed code
C5	Copy the BIOS from ROM into E0000-FFFFF shadow RAM so that POST will go faster
01	Clear base memory 0~640K
0C	Initial interrupt vector 00-1FH
0D	Initial ISA VGA
41H	Enable FDD and detect media type
FFH	Boot from FDD

♀ **This page is for Non-Compressed Version only**

01-02	Reserved
C0	Turn off OEM specific cache, shadow...

03	1. Initialize EISA registers (EISA BIOS only)
	 2. Initialize all the standard devices with default values Standard devices includes:
	     -DMA controller (8237)
	     -Programmable Interrupt Controller (8259)
	     -Programmable Interval Timer (8254)
	     -RTC chip

04	Reserved
05	1. Keyboard Controller Self-Test 2. Enable Keyboard Interface
06	Reserved
07	Verifies 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(Suprious) Interrupt Handler 2. Issue CPUID instruction to identify CPU type 3. Early Power Management initialization (OEM specific)

♀ The following POST Codes are for all of Compress Version & Non-Compress Version

POST (hex)	Description
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 IO & Memory for PCI devices (PCI BIOS only)
0C	Initialization of the BIOS Data Area (40 : 00 – 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 which consists of one single long beep followed by two short beeps.

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 Logo (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
12-13	Reserved
14	Test 8254 Timer 0 Counter 2.
15	Test 8259 interrupt mask bits for channel 1
16	Test 8259 interrupt mask bits for channel 2
17	Reserved
19	Test 8259 functionality
1A-1D	Reserved
1E	If EISA NVM checksum is good, execute EISA initialization (EISA BIOS only)
1F-29	Reserved
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
33-3B	Reserved
3C	Set flag to allow users to enter CMOS Setup Utility
3D	1. Initialize Keyboard 2. Install PS2 mouse

POST(hex)	Description
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

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 values 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
44	Reserved
45	Initialize math coprocessor.
46-4D	Reserved
4E	If there is any error detected (such as video, kb...), show all the error messages on 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
51	Reserved

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 IO, 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 settin

BIOS Default Drive Table

This is a current list of the drive type table contained in Setup.

Type	Size (MB)	Cylinders	Heads	Sectors	Write Precomp	Land Zone	Example Model
1	10	306	4	17	128	305	TEAC SD510, MMI 112, 5412
2	20	615	4	17	300	615	Seagate ST225, ST4026
3	30	615	6	17	300	615	
4	62	940	8	17	512	940	
5	46	940	6	17	512	940	
6	20	615	4	17	None	615	Seagate ST125, Tandon TM262
7	30	462	8	17	256	511	
8	30	733	5	17	None	733	Tandon TM 703
9	112	900	15	17	None	901	
10	20	820	3	17	None	820	
11	35	855	5	17	None	855	
12	49	855	7	17	None	855	
13	20	306	8	17	128	319	Disctron 526, MMI M125
14	42	733	7	17	None	733	
15		Reserved					
16	20	612	4	17	0	663	Microscience HH725, Syquest 3250, 3425
17	40	977	5	17	300	977	
18	56	977	7	17	None	977	
19	59	1024	7	17	512	1023	
20	30	733	5	17	300	732	
21	42	733	7	17	300	732	
22	30	306	5	17	300	733	Seagate ST4038
23	10	977	4	17	0	336	
24	40	1024	5	17	None	976	Seagate ST4051
25	76	1224	9	17	None	1023	Seagate ST4096
26	71	1224	7	17	None	1223	Maxtor 2085

27	111	1224	11	17	None	1223	Maxtor 2140, Priam S14
28	152	1024	15	17	None	1223	Maxtor 2190, Priam S19
29	68	1024	8	17	None	1023	Maxtor 1085, Micropolis 1325
30	93	918	11	17	None	1023	Maxtor 1105 1120, 4780
31	83	925	11	17	None	1023	Maxtor 1170
32	69	1024	9	17	None	926	CDC 9415
33	85	1024	10	17	None	1023	
34	102	1024	12	17	None	1023	
35	110	1024	13	17	None	1023	
36	119	1024	14	17	None	1023	
37	17	1024	2	17	None	1023	
38	136	1024	16	17	None	1023	
39	114	918	15	17	None	1023	Maxtor 1140, 4380
40	40	820	6	17	None	820	Seagate ST251
41	42	1024	5	17	None	1023	Seagate 4053 Miniscribe 3053/6053
42	65	1024	5	26	None	1023	Miniscribe 3053/6053 RLL
43	40	809	6	17	None	852	Miniscribe 3650
44	61	809	6	26	None	852	Miniscribe 3675 RLL
45	100	776	8	33	None	775	Conner CP3104
46	203	684	16	38	None	685	Conner CP3204
User							

Appendix 1
Watch Dog Timer

Watch Dog Timer Working Procedure

The Watch Dog Timer (WDT) is the special hardware device. The WDT function is to monitor the computer system whether work normally, otherwise, it will have some measures to fix up the system.

It contains a receivable SQW signal from RTC, and could set time and can clear the counter function. When time is up, WDT can send Reset or NMI signal.

Operator has to write a value into WDT Configuration Register (Write the control value to the Configuration Port), and clear WDT counter (read the Configuration Port).

Watch Dog Timer character and function

WDT Configuration port	F2	Default at F2
Watch Dog Timer	Disabled	1. Default at disabled
	Enabled	2. Enabled for user's programming
WDT Time out active for	Reset	Default at Reset
	NMI	
WDT Active Time	1 sec	Default at 64 sec
	2 sec	
	4 sec	
	8 sec	
	16 sec	
	32 sec	
	64 sec	

Watch Dog Timer Control Register

The Watch Dog Timer Control Register is to control the WDT working mode. You can write the value to WDT Configuration Port.

The following is the Control Register bit definition.

7	6	5	4	3	2	1	0
X	x	X					

111 : N/A

110 : Select 1 second

101 : Select 2 second

100 : Select 4 second

011 : Select 8 second

010 : Select 16 second

001 : Select 32 second

000 : Select 64 second

1 : Enable watch dog timer

0 : Disable watch dog timer

1 : Select NMI

0 : Select Reset

Don' t care
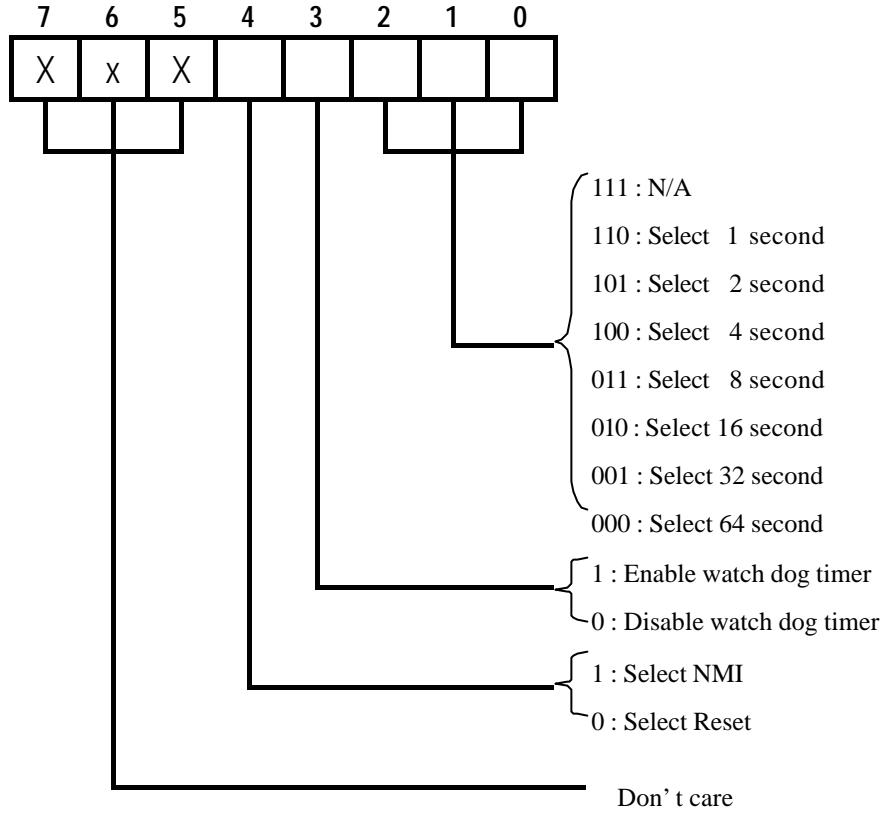
Watch Dog Timer Programming Procedure

· **Power on or reset the system**

The initial value of WDT Control Register (D4~D0) is zero, when power is on or reset the

system. The following means the initial value of WDT (00000000b) :

Bit	Value	Mean
4	0	Select Reset
3	0	Disable watch dog timer
2, 1, 0	0 0 0	Select 64 second

· **Initialize the SQW of RTC (set SQW output period=0.5 second)**

To initialize the SQW of RTC processor is to set the SQW signal which is output

period=0.5 second.   It offers the basic frequency of the WDT counter.

The following is an example of **initializing the SQW signal program** in Intel 8086

assembly language.

```
; (Generate SQW = 0.5 Sec.)
Mov  dx, 70h
Mov  ax, 0Ah
Out   dx, al        ; Out port 70h = 0Ah
Mov  dx, 71h
Mov  ax, 2Fh
Out   dx, al        ; Out port 71h = 2Fh
; (enable the SQW output)
Mov  dx, 70h
Mov  ax, 0Bh
Out   dx, al        ; Out port 70h = 0Bh
Mov  dx, 71h
Mov  ax, 0Ah
Out   dx, al        ; Out port 71h = 0Ah
```

・ **Clear the WDT**

Repeatedly read WDT Configuration Port and the interval cannot be longer than the preset time, otherwise, the WDT will generate NMI or Reset signal for the system.

The following is an example of **clear the WDT program** in Intel 8086 assembly language.

```
; ( Clear the WDT)
Mov   dx, F2h  ;Setting the WDT configuration port
In    al, dx
```

Note: Before running WDT, you must clear the WDT. It means to make sure the initial value is zero before enabling the WDT.

・ **WDT Control Register (Write to WDT configuration port)**

You can set the WDT Control Register to control the WDT working mode.

The initial value of the WDT Control Register is as the following.

```
; (Setting the WDT Control Register as AL)
Mov      al, 0h  ; Setting initial value = 0 for the WDT Control Register
```

You must plan the option of following:

1. Select NMI or Reset: decide D4 value in F2.

   i.e. Setting D4 = 0, then it select Reset

   ```
   AND      al, 11101111b  ; Select Reset
   ```

   i.e. Setting D4 = 1, then it select NMI

   ```
   OR al, 00010000b  ; Select NMI
   ```

2. Select the time-out intervals of WDT (decide the values of D2, D1, D0 in F2)

   Example: D2~D0 = 0, the time-out interval will be 64 sec.

   ```
   AND      al, 11111000b  ; Setting the time-out interval as 64 sec.
   ```

3. Enable or Disable the WDT (decide D3 value in F2)

i.e. D3=0, Disable the WDT

```
AND     al, 11110111b  ; Disable the WDT
```

i.e. D3=1, Enable the WDT

```
OR      al, 00001000b  ; Enable the WDT
```

After finishing the above setting, you must be output for the Control Register's value to the WDT Configuration Port. Then WDT will start according to the above setting.

```
MOV     dx, F2h    ; Setting WDT Configuration Port
OUT     dx, al        ; Output the Control Register Value
```

• You should build in a mechanism in the program to continue to read the WDT Configuration Port for clearing WDT before the time out.

Appendix 2
Memory Mapping

A memory map diagram showing the following regions from top to bottom:

- (1MB) 100000 / ON BOARD DRAM
- FFFFF – F0000 / SYSTEM BIOS
- EFFFF – E0000 / (may reserve for free space)
- DFFFF – D4000 / FREE
- D3FFF – D0000 / LAN BIOS
- CFFFF – CC000 / ON BOARD SCSI BIOS
- CBFFF – C0000 / VIDEO BIOS
- BFFFF – A0000 / VIDEO RAM
- 9FFFF – 0 / 640K to 0

Memory address E0000~EFFFF may be free after BIOS completing boot