IPC-50002

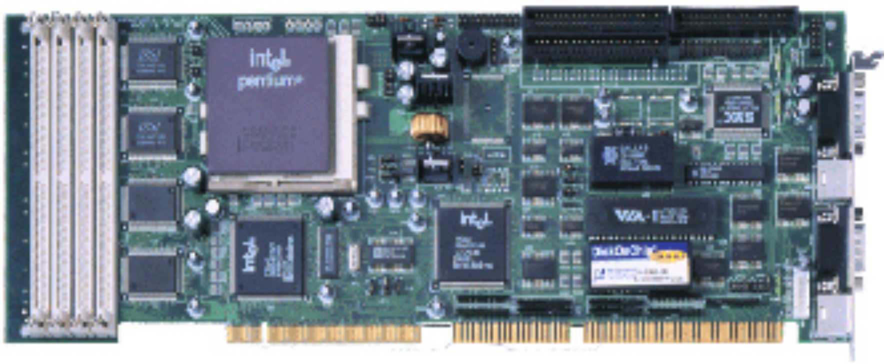
Full-size CPU Card Series

User's Manual

Contents

CHAPTER 1 INTRODUCTION

Welcome to the IPC-50002 Pentium single board computer.



The IPC-50002 is a brand new generation of advanced technologies. It's built with high performance Pentium CPU and compatible, high performance PCI Bus and I/O's, huge memory support (256MB), and complied with the new PICMG standard, and the brand new technologies: the pipeline burst cache is included. It's excellent to the system integrators, VARs, or turnkey vendor demanding high performance computing, high performance I/O and great system expandability.

The IPC-50002 can run with Intel Pentium processor up to 233MHz, memory support up to 512KB cache traditional SRAM and 256MB DRAM. This generates great computing power. The on board enhanced PCI IDE interface can support up to mode 4 PIO and mode 2 DMA Master to connect both hard disk and IDE CD-ROM drive. The SMC 37C669 integrates the floppy controller, two serial ports and one parallel port. The two on-chip UARTS are compatible with NS 16C550, and the parallel port support EPP/ECP.

The PICMG standard makes the IPC-50002 work with the legacy ISA back plane and brand new PCI back plane.

The additional keyboard connector is reserved for connecting to the keyboard connector on the back plane.

1.1 Specifications

- **Main processor:** Intel Pentium p54C, p55C up to 233MHz AMD K5, K6 up to 233MHz Cyrix M1, M2 up to 233MHz
- **Main Memory:** Four 72 pin SIMM sockets, DRAM size up to 256MB Extended-Data-Output (EDO) DRAM supported
- **Cache Memory:** Standard 512KB external cache
- **BIOS:** AWARD 1MB Flash BIOS
- **Chipset:** Intel 82437VX, 82438VX, 82371 chipset
- **Clock /Calendar:** DALLAS DS12887 Real time clock/calendar High precision
- **Bus Interface:** PCI (32bit) and ISA (16bit)
- **Serial Ports:** Support 2 high speed serial port, Data transfer rate are programmable up to 50K baud independently.
- **Parallel ports:** Support one ECP/EPP bi-directional parallel port
- **PCI IDE Hard Disk Interface:** Support up to four enhanced IDE hard disk up to mode 4 PIO and mode 2 DMA master
- **Floppy Drive Controller:** Up to 2 floppy drives supported 5 1/4 " , 360K, 1.2MB, 3 1/2 " 720K, 1.2MB， 1.44MB, 2.88MB support
- **Timers:** Programmable timers
- **Keyboard Connectors:** Both 5-pin header and 6-pin mini-din connector supported on back panel
- **PS/2 mouse port connector:** By 6-pin mini-din connector
- **USB Connector (USB cable option):** The IPC-50002 provides two USB interface. Comply with USB specification rev. 1.0 and fuse protected.
- **Power Good:** Power good generation with reset time, 300~500ms
- **Power Requirement:** +5V@6.0A(Max.), +/-12V@20mA

- **Physical Information**

  Dimension: 338mmx 122mm

  Weight: 600g

- **Environmental Information**

  Operating Temperature: 0℃~60℃

  Storage Temperature: -40℃~100℃

  Relative Humidity: 0~90%

1.2 What You'll Have From The Package

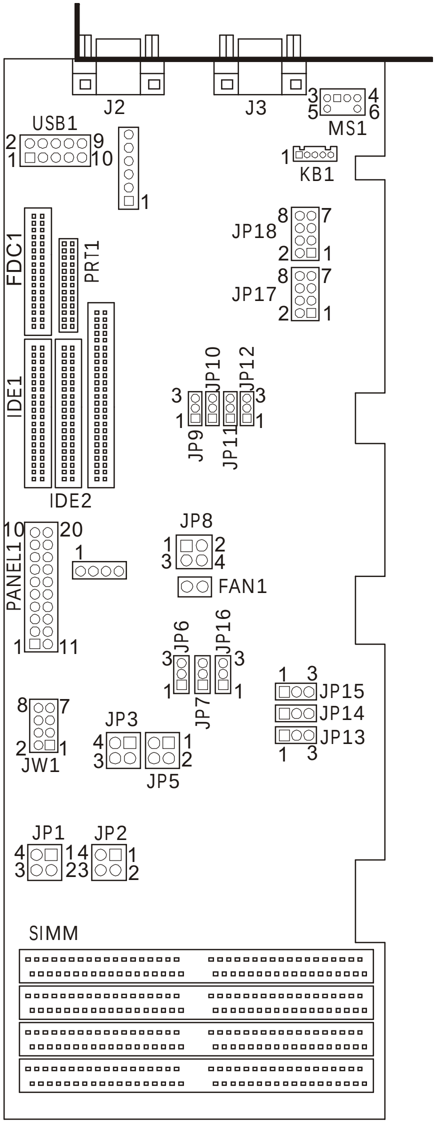
In addition to this manual, the IPC-50002 package includes the following items.

- IPC-50002 single board computer x1
- Printer and SIO cable x1
- FDC cable x1
- IDE cable x1
- 5 pin to 5 pin keyboard cable x1 (for DIN keyboard connector)

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

CHAPTER 2 JUMPERS AND CONNECTORS

2.1 Board Layout



Jumper Setting Table (*: default setup)

CPU Type Selection

CPU Type	JP1	JP2	JP3	JP5	JP8
*Intel p54C	open	open	1-2, 3-4	1-2, 3-4	1-2
Intel p55C	1-2, 3-4	1-2, 3-4	open	open	1-2
AMD K5	open	open	1-2, 3-4	1-2, 3-4	1-2
AMD K6	1-2, 3-4	1-2, 3-4	open	Open	1-2
Cyrix 6x86	1-2, 3-4	open	1-2, 3-4	1-2, 3-4	1-2
Cyrix 6x86L	open	1-2, 3-4	open	open	1-2

JW1: Power Voltage (Core Vcc)

Voltage	JW1
2.1	1-2
2.2	3-4
2.3	1-2, 3-4
2.4	5-6
2.5	1-2, 5-6
2.6	3-4, 5-6
2.7	1-2, 3-4, 5-6
2.8	7-8
2.9	1-2, 7-8
3.0	3-4, 7-8
3.1	1-2, 3-4, 7-8
3.2	5-6, 7-8
3.3	1-2, 5-6, 7-8
3.4	3-4, 5-6, 7-8
3.5	1-2, 3-4, 5-6, 7-8

Select The Frequency Ratio

CPU Frequency	JP6	JP7	JP16
1.5x	1-2	1-2	open
*2.0x	2-3	1-2	open
2.5x	2-3	2-3	open
3.0x	1-2	2-3	open
3.5x	1-2	1-2	1-2
4.0x	2-3	1-2	2-3
4.5x	2-3	2-3	2-3
5.0x	1-2	2-3	2-3
5.5x	1-2	1-2	2-3

CPU External Clock Speed

CPU External Clock	JP13	JP14	JP15
50MHz	2-3	2-3	2-3
60MHz	1-2	2-3	2-3
*66MHz	2-3	1-2	2-3
75MHz	1-2	2-3	1-2

Clearing CMOS

Clear CMOS	JP9
*Normal Operation	1-2
Clear CMOS	2-3

Disabling the PS/2 Mouse Function

PS/2 Mouse	JP11
*Enable	1-2
Disable	2-3

2.2 Connectors

Connector	Function	Remark
PANELI	Key lock connector	1-2
	Power LED connector	3-5
	Speaker connector	7-10
	Green LED connector	12-13
	Suspend switch	15-17
	Reset switch	19-20
USB1	USB interface connector	
IR1	IrDA connector	
IDE1	IDE 1 connector	Primary IDE Interface
IDE2	IDE 2 connector	Secondary IDE Interface
J1	SCSI connector	SCP530 only
PRT1	Parallel connector	
FDC1	FDD connector	
KB1	Internal Keyboard connector	
PS2/M	PS/2 mouse connector	
PS2/K	Keyboard Mini Din connector	
COM1	Primary serial port connector	
COM2	Secondary serial port connector	
FAN1	CPU fan 12V power connector	
HDDLED1	Hard drive LED connector	

- **PANEL1**

Function	PIN NO.	Description
Power LED/ Keylock	1	Ground
	2	Keylock
	3	Ground
	4	N/C
	5	+5V
Speaker	7	+5V
	8	Ground
	9	NC
	10	Speaker Signal
Green LED Connector	12	Ground
	13	Green LED
Reset Button	19	External Reset
	20	Ground
HDD LED	1, 4	+5V
	2, 3	HDD Active#

- **DE1, IDE2: 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	N/C
33	SA1	34	N/C
35	SA0	36	SA2
37	HDC CSO#	38	HDC CS1#
39	HDD Active#	40	Ground

- **J1: 50 Pin SCSI Connector**

PIN NO.	Description	PIN NO.	Description
1	Ground	2	SCSI Data 0
3	Ground	4	SCSI Data 1
5	Ground	6	SCSI Data 2
7	Ground	8	SCSI Data 3
9	Ground	10	SCSI Data 4
11	Ground	12	SCSI Data 5
13	Ground	14	SCSI Data 6
15	Ground	16	SCSI Data 7
17	Ground	18	SCSI Low Byte Parity#
19	Ground	20	Ground
21	Ground	22	Ground
23	Ground	24	Ground
25	Ground	26	Termination Power
27	Ground	28	Ground
29	Ground	30	Ground
31	Ground	32	Attention#
33	Ground	34	Ground
35	Ground	36	Busy#

37	Ground	38	Acknowledge#
39	Ground	40	Reset#
41	Ground	42	Message#
43	Ground	44	Select#
45	Ground	46	Command/Data#
47	Ground	48	Request#
49	Ground	50	In/Out#

- **PRT1: 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		

- **FDC1: FDC Connector**

PIN NO.	Description	PIN NO.	Description
1	Ground	2	Density
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 A#
13	Ground	14	Drive Select A#
15	Ground	16	Motor Enable B#
17	Ground	18	Direction#
19	Ground	20	Step#
21	Ground	22	Write Date#
23	Ground	24	Write Gate#
25	Ground	26	Track 0#
27	Ground	28	Wrote Protect#
29	N/C	30	Read Data#
31	Ground	32	Head Side Select#
33	N/C	34	Disk Change#

- **J2 (COM1), J3 (COM2): Serial Port Connector**

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)

- **KB1: Keyboard Connector**

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

- **KB2: 6-pin Mini-DIN Keyboard Connector (PS/2 Type)**

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

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 DRAM is provided by SIMMS (Single In-line Memory Modules) on the CPU board. The CPU board contains two memory banks: Bank 0 corresponds to connector SIMM 1 and SIMM2, Bank 1 to SIMM3 and SIMM4.

The table below shows possible SIMM configurations for the memory banks and the figure helps you correctly install the SIMM modules. You must install 2 PCS DRAM modules (same size, same speed, either single or double side) for each bank at a time, and no difference which bank you install first. See Figure 3-1 for memory banks location.

SIMM 1	SIMM 2	SIMM 3	SIMM 4	Total Memory
4MB	4MB	Empty	Empty	8MB
4MB	4MB	4MB	4MB	16MB
8MB	8MB	Empty	Empty	16MB
8MB	8MB	4MB	4MB	24MB
8MB	8MB	8MB	8MB	32MB
16MB	16MB	Empty	Empty	32MB
16MB	16MB	4MB	4MB	40MB
16MB	16MB	8MB	8MB	48MB
16MB	16MB	16MB	16MB	64MB
32MB	32MB	Empty	Empty	64MB
32MB	32MB	4MB	4MB	72MB
32MB	32MB	8MB	8MB	80MB
32MB	32MB	16MB	16MB	96MB
32MB	32MB	32MB	32MB	128MB
64MB	64MB	Empty	Empty	128MB

64MB	64MB	16MB	16MB	160MB
64MB	64MB	32MB	32MB	192MB
64MB	64MB	64MB	64MB	256MB

You can also use the SIMM with parity check, e.g. 4Mbit x 36 rather than 4Mbit X32. Note: because 64MB SIMM is not popular yet, the compatibility of 64 MB SIMM has not get rigid guaranty.

The SIMM used could be either FP memory (Fast Page Mode) or EDO memory (Extended Data Out). For the FP memory, the speed should be no slower than 70ns.

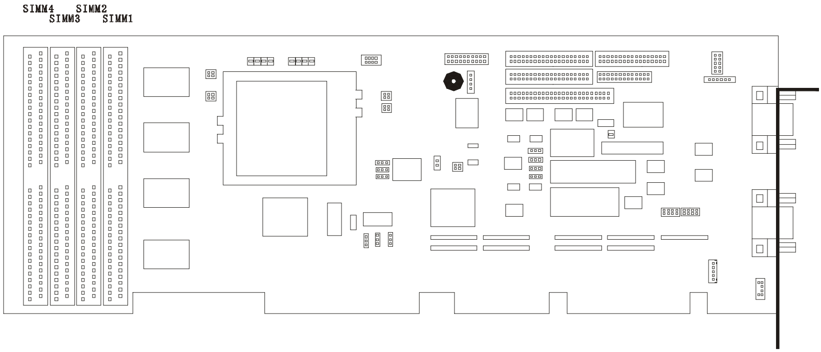


Figure 3.1 Memory Banks

3.2 Change CPU

To change the CPU, pull the handling bar of the socket upward to the other end to loosen the socket's. Carefully lift the existing CPU up to remove it from the socket.

Place the new CPU on the middle of the socket, orienting its bevel corner to line up with the socket's bevel corner. Make sure the pins of the CPU fit evenly to the socket's openings. Replace the handling bar to fasten the CPU to the socket. Be sure to re-arrange the jumper setting for the correct CPU Type (JP1, 2, 3, 5, 8), Core/Bus ratio (JP6, 7, 16), clock (JP13, 14, 15), Core Vcc (JW1). Intel Pentium P54C, P55C, AMD K5, K6 and Cyrix M1, M2 compatible are supported by this CPU board.

CHAPTER 4 AWARD BIOS SETUP

AWARD 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.

4.1 Entering Setup

Power on the computer and press <Del> immediately will allow you to enter Setup.

If the message disappears before you 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.

4.2 The Main Menu

Once you enter the Award BIOS CMOS Setup Utility, the Menu will appe ar on the screen. The Main Menu allows you to select from ten setup functio ns and two exit choices. Use the arrow keys to select the setup function you intend to configure then press <Enter>to accept or enter its sub-menu.

ROM PCI/ISA BIOS (2A59GA39)
CMOS SETUP UTILITY
AWARD SOFTWARE, INC.

STANDARD CMOS SETUP	INTEGRATDE PERIPHERALS
BIOS FEATURES SETUP	SUPERVISOR PASSWORD
CHIPSET FEATURES SETUP	SUER 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	↑↓ → ← : Select Item
F10: Save & Exit Setup	(Shift)F2 : Change Color
Time, Date Hard Disk Type…	

- **Standard CMOS Setup**
  This setup option includes all the items in a standard compatible BIOS.
- **BIOS Features Setup**
  This setup page includes all the items of AWAR special enhanced features.
- **Chipset Features Setup**
  This setup option includes all the items of chipset special features.
- **Power Management Setup**
  This category determines the power consumption of the system after selecting its items. Default value is Disabled.
- **PNP/PCI Configuration**
  This category specifies the assignment of all IRQs and DMAs.
- **Load BIOS Defaults**
  BIOS defaults indicate the most appropriate values of the system parameter in which the system can operate at a minimum performance.
- **Load Setup Defaults**

Chipset defaults indicate the values required by the system for maximum performance.

- **Integrated Peripherals**

  This page allows you to set up all the on board I/O controllers like IDE, SCSI, FDC, etc..

- **Supervisor / User Passwords**

  Changes, sets or disables password of Supervisor or User. It allows you to restrict access to the system and Setup, or just to Setup.

- **IDE HDD Auto Detection**

  Automatically configures hard disk parameters.

- **HDD Low Level Format**

  Hard disk low level format utility.

- **Save & Exit Setup**

  Saves CMOS value changes to CMOS and exits setup.

- **Exit Without Saving**

  Abandons all CMOS value changes and exits setup.

4.3 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 (2A59GA39)
STANDARD CMOS SETUP
AWARD SOFTWARE, INC.

Date(mm:dd:yy) : Fri, Jul 18 1997

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	------
Primary Slave:	Auto	0	0	0	0	0	0	------
Secondary Master:	Auto	0	0	0	0	0	0	------
Secondary Slave:	Auto	0	0	0	0	0	0	------

Drive A :1.44M, 3.5in — Base Memory: 640K

Drive B : None — Extended Memory:14336K

Video :EGA/VGA — Other Memory: 384K

Halt On :All Errors — Total Memory:15360K

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, depends on the year of BIOS

- **Time**

  The time format is <hour><minute><second>accepting either function key or numerical key. The time is calculated based in 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 one channel that have been installed in the computer. There are 45 predefined types and 2 user definable types are for Enhanced IDE BIOS. Type I 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 within this category. If your hard disk drive type does not match or is not 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, select "Type 1".

If the controller of HDD interface is SCSI, select "None".

If the controller of HDD interface is CD-ROM, select "None".

CYLS	Number of cylinders	LANDZONE	Landing zone
HEADS	Number of heads	SECTORS	Number of sectors
PRECOMP	Write precom	MODE	HDD access mode

If there is no hard disk drive 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 installed in the computer.

None	No floppy drive installed
360K, 5.25in	5.25 inch PC-type standard drive; 360Kb capacity
1.2K, 5.25 in	5.25 inch AT-type high-density drive; 1.2MB capacity
720K, 3.5 in	3.5 inch double-sided drive; 720Kb capacity
1.44M, 3.5in	3.5 inch double-sided drive; 1.44MB capacity
2.88M, 3.5in	3.5 inch double-sided drive; 2.88MB capacity

- **Video**

The category selects the type of adapter used for the primary system monitor that must match your video display card and monitor. Although secondary monitors are supported, you do not have to select the type in Setup. You have two ways to boot up the system:

1. When VGA as primary and monochrome as secondary, the selection for the video type is “VGA Mode”.
2. When monochrome as primary and VGA as secondary, the selection of the video type is “Monochrome Mode”.

EGA/VGA	Enhanced Graphics Adapter/Video Graphics Array. For EGA, VGA, SEGA, or PGA monitor adapters
CGA 40	Color Graphics Adapter, power up in 40 column mode
CGA 80	Color Graphics Adapter, power up in 80 column mode
MONO	Monochrome adapter, includes high resolution monochrome adapters

- **Error halt**

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

All errors	Whenever the BIOS detect a non-fatal error, the system will halt and you will be prompted.
No errors	The system boot will not stop for any error detected.
All, But Keyboard	System boot will not stop for a keyboard error; it will stop for all other errors.
All, But Diskette	System boot will not stop for a disk error; it will stop for all other errors.
All, But Disk/key	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 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 51 2K 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.

4.4 BIOS Features Setup Menu

ROM PCI/ISA BIOS (2A59GA39)

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	:Enabled	D0000-D3FFF Shadow	:Disabled
Boot Sequence	:A,C,SCSI	D40000-D7FFF Shadow	:Disabled
Swap Floppy Seek	:Disabled	D80000-DBFFF Shadow	:Disabled
Boot Up Floppy Drive	:Enabled	DC000-DFFFF Shadow	:Disabled
Boot Up Numlock Status	:On	Cyrix 6x86/MII CPUID	:Enabled
Boot Up System Speed	:High		
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 Option	:Disabled	F6: Load BIOS Defaults	
OS Select for DRAM>64MB	:Non-OS2	F7: Load Setup Defaults	

- **Virus Warning**

  This option flashes on the screen. During and after the system boot up, any attempt to write to the boot sector or partition table of the hard disk drive will halt the system with the following message. You can run an anti-virus program to locate the problem. The default setting is “Disabled”.

> ***!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 there is an attempt to access the boot sector or hard disk partition table.
Disabled	No warning message will appear when attempts to access the boot sector or hard disk partition table are made.

NOTE: This function is only available with DOS and other operating systems that do not trap INT13.

- **CPU Internal Cache/External Cache**

  These two options speed up memory access. However, it depends on the CPU/chipset design. The default setting is “Enabled”. CPUs with no built-in internal cache will not provide the ”CPU Internal Cache” item on the menu.

Enabled	Enable cache
Disabled	Disabled cache

- **Quick Power On Self Test**

  This option speeds up Power On Self Test (POST) after you turn on the items during POST. The default setting is “Enabled”. system power. If set as Enabled, BIOS will shorten or skip some check

Enabled	Enable Quick POST
Disabled	Normal POST

- **Boot Sequence**

  This field determines the drive that the system searches first for an operating system searches firs for an operating system. The available options are:

- A, C, SCSI
- C, A, SCSI
- C, CDROM, A
- CDROM, C, A
- D, A, SCSI
- SCSI, C, A
- C only
- LS/ZIP, C
- SCSI, A, C

The default value is A, C, SCSI.

- **Boot UP Floppy Seek**

  During POST, BIOS will determine the floppy disk drive type, 40 or 80 tracks, installed in the system. 360Kb type is 40 tracks while 720 KB, 1.2MB and 1.44MB are all 80 tracks. The default value is "Enabled".

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. There will be no warning message displayed if the drive installed is 360k

- **Boot Up Num Lock Status**

  This option enables and disables the number lock function of the keypad. The default value is "on".

- **Boot Up System Speed**

  It selects the default system speed- the speed that the system will operate immediately after power up. The default value is "High".

High	Sets the speed to high
Low	Sets the speed to low

- **Gate A20 option**

  The default value is "Fast".

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 of the keyboard. The default value is " Disabled".

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

- **Typematic Rate (chars/Sec)**

  This option refers to the number of characters the keyboard can type per second. The default value is “6”.

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)**

  This option sets the display time interval from the first to the second character when holding a key. The default value is “250”.

250	250 ms
500	500 ms
750	750 ms
1000	1000 ms

- **Security Option**

  This item allows you to limit access to the system and Setup, or just to Setup. The default value is “setup”.

System	The system will not boot and access to Setup will be denied if the incorrect password is 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 the Main Menu and then you will be asked to enter password. Do not type anything, just press <Enter>and it will disable security. Once the security is disabled, the system will boot and you can enter setup freely.

- **OS Select for DRAM >64**

  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 (under non-OS2), default is NON-OS2. the default value is “Non-OS2”.

- **Video BIOS Shadow**

  Video shadowing increases the video speed by copying the video BIOS into RAM. However, it is still optional depending on the chipset design. The default value of this option is “Enabled”.

Enabled	Video BIOS shadowing is enabled
Disabled	Video BIOS shadowing is disabled

- **C8000-CBFFF Shadow/DC000-DFFF Shadow**

  These options determine whether optional ROM will be copied to RAM by 16K byte or 32K byte per/unit. The default value for all is “Disabled”.

Enabled	Optional shadow is enabled
Disabled	Optional shadow is disabled

NOTE: 1.For C8000-DFFFF option-ROM on PCI BIOS-BIOS automatically enables the shadow RAM. User does not have to select the item.

2. IDE second channel control:
   Enable: enables secondary IDE port and IRQ 15 is available for other device(s). The item is optional only for PCI BIOS.
3. Some sound cards have an onboard CD-ROM controller that uses IDE Secondary port. To avoid PCI IDE conflict, disable the IDE secondary channel control so that the CD-ROM may work.

4.5 Chipset Features Setup Menu

Since the features in this section are related to the chipset on the CPU board and are completely optimized, you are not recommended to change the default settings in this setup table unless you are well oriented with the chipset features.

ROM PCI/ISA BIOS (2A59GA39)
CHIPSET FEATURES SETUP
AWARD SOFTWARE, INC.

Auto Configuration	:Enabled		
DRAM Timing	:70ms		
		Passive Release	:Enabled
DRAM RAS# Precharge Time	:4	Delayed Transaction	:Disabled
DRAM R/W Leadoff Timing	:6		
Fast RAS To CAS Delay	:3		
DRAM Read Burst (EDO/FP)	:×333/444		
DRAM Write Burst Timing	:×333		
Fast MA to RAS# Delay CLK	:1		
Fast EDO Path Select	:Disabled		
Refresh RAS# Assertion	:5Clks		
ISA Bus Clock	:PCI CLK/4		
System BIOS Cacheable	:Disabled		
Video BIOS Cacheable	:Disabled	ESC: Quit ↑ ↓ → ←	:Select Item
8 Bit I/O Recovery Time	:1	F1:Help	PU/PD/+/-:Modify
16 Bit I/O Recovery Time	:1	F5:Old Values	(Shift)F2:Color
Memory Hole at 15M-16M	:Disabled	F6:Load BIOS Defaults	
Peer Concurrency	:Enabled	F7:Load Setup Defaults	

- **Auto Configuration**

  Auto Configuration selects predetermined optimal values of chipset parameters. When disabled, chipset parameters revert to setup information stored in CMOS. Many fields in this screen are not available when Auto Configuration is enabled. The default value is “Disabled”.

- **DRAM Timing**

  Selects the combination of CPU clocks the DRAM on your board requires before each read from or write to the memory. Changing the value from the setting determined by the board designer for the installed DRAM might cause memory errors. The default value is “10/6/3”.

- **Fast RAS to CAS Delay**

  When DRAM is refreshed, both rows and columns are addressed separately. This field lets you insert a timing delay between the CAS and RAS strobe signals used when DDRAM is written to, read from, or refreshed. The default value is “3”.

- **DRAM Read Burst (EDO/FP)**

  The value in this field depends on performance parameters of the installed memory chips (DRAM). Do not change the value from the factory setting unless you install new memory that has a different performance rating than the original DRAMS. The default value is “60ns”.

- **DRAM R/W Leadoff Timing**

  Selects the timing for reads from EDO (Extended Data Output) or FPM (Fast Page Mode) memory. The lower the timing numbers, the faster the system addresses memory. Selecting timing numbers lower than the installed DRAM specifications may result in memory errors. The default value is “x222/x333”.

- **DRAM Write Burst Timing**

  Sets the timing for writes to memory. The lower the timing numbers, the faster the system addresses memory. Selecting timing numbers lower than the installed DRAM specifications may result in memory errors. The default value is “x222”.

- **Fast MA to RAS# Delay CLK**

  The values in this field are set by the system board designer, depending on the DRAM installed. Do not change the values in this field unless you change the specifications of installed DRAM or the installed CPU. The default value is “2 Clks”.

- **Fast EDO Path Select**

  Set this option to Enabled only when using EDO DRAMs in either a synchronous cache or a cache-less system. It causes a 1-HCLK pull-in for all read leadoff latencies for EDO DRAMs (i.e., page hits, page misses, and row misses). Select Disabled if any of the DRAM rows is populated with FPM DRAMs. The default value is “Disabled”.

- **Refresh RAS# Assertion**
  This item selects the number of clock ticks RAS# (Row Address Strobe) is asserted for refresh cycles. The default value is “4 Clks”.
- **System BIOS Cacheable**
  Selecting Enabled allows caching of the system BIOS ROM at F0000h-FFFFh, resulting in better system performance. However, if any program writes to this memory area, a system error may result. The default value is “Disabled”.
- **Video BIOS Cacheable**
  Selecting Enabled allows caching of the video BIOS ROM at C0000h-C7FFFh, resulting in better video performance. However, if any program writes to this memory area, a system error may result. The default value is “Disabled”.
- **8/16 Bit I/O Recovery Time**
  The I/O recovery mechanism adds bus clock cycles between PCI-originated I/O cycles to the ISA bus. This delay takes place because the PCI bus is so much faster than the ISA bus. These two fields let you add recovery time (in bus clock cycles) for 16-bit and 8-bit I/O. The default values are “1” for 8 Bit I/O Recovery Time and “2” for 16Bit I/O Recovery Time.
- **Memory Hole at 15M-16M**
  You can reserve this area of system memory for ISA adapter ROM. When this area is reserved, it cannot be cached. The user information of peripherals that need to use this area of system memory usually discusses their memory requirements. The default value is “Disabled”.

4.6 Power Management Setup

The Power Management Setup screen appears like this:

ROM PCI/ISA BIOS (2A59GA39)
POWER MANAGEMENT SETUP
AWARD SOFTWARE, INC.

Power Management	:Disabled	ERQ5(LPT2)	:OFF
PM Control by APM	:Yes	IRQ6(Floppy Disk)	:OFF
Video Off Method	:V/H SYNC+Blank	IRQ7(LPT1)	:OFF
Video Off After	:Standby	IRQ8(RTC Alarm)	:OFF
Modem Use IRQ	:3	IRQ9(IRQ2 Redir)	:OFF
Doze Mode	:Disabled	IRQ10(Reserved)	:OFF
Standby Mode	:Disabled	IRQ11(Reserved)	:OFF
Suspend Mode	:Disabled	IRQ12(PS/2 Mouse)	:OFF
HDD Power Down	:Disabled	IRQ13(Coprocessor)	:OFF
Wake Up Events In Doze & Standby		IRQ14(Hard Disk)	:On
IRQ3(Wake-Up Events)	:On	IRQ15(Reserved)	:OFF
IRQ4(Wake-Up Events)	:On		
IRQ8(Wake-Up Events)	:On	ESC: Quit ↑ ↓ → ←	:Select Item
IRQ12(Wake-Up Events)d	:On	F1: Help PU/PD/+/- : Modify	
Power Down & Resume Events		F5: Old Values (Shift) F2: Color	
IRQ3(COM2)	:On	F6; Load BIOS Defaults	
IRQ4(COM1)	:On	F7: Load Setup Defaults	

- **Power Management**

  This option allows you to select the type (or degree) of power saving for Doze, Standby, and Suspend modes. The table below describes each power management mode:

Max Saving	Maximum power savings. Only Available for SL CPUs. Inactivity period is 1 minute each mode.
User Define	Sets each mode individually. Select time-out periods in the PM Timers section, following.
Min Saving	Minimum power savings. Inactivity period is 1 hour in each mode (except the hard drive).
Disabled	Default value

- **PM Control by APM**

If Advanced Power Management (APM) is installed on your system, selecting Yes gives better power savings. The default value is “Yes”.

No	System BIOS will ignore APM when power managing the system
Yes	System BIOS will wait for APM’S prompt before it enters any PM mode (i. e., DOZE, STANDBY or SUSPEND). **NOTE:** If APM is installed or if there is a task running, even when the timer has timed out, the APM will not prompt the BIOS to put the system into any power saving mode!

NOTE: If APM is not installed, this option has no effect.

- **Video Off Method**

Determines the manner on which the monitor is blanked.

V/H SYNC +Blank	Turns OFF vertical and horizontal synchronization ports and writes blanks to the video buffer
DPMS	Select this option if your monitor supports the Display Power Management Signaling (DPMS) Standard of the Video Electronics Standards Association (VESA). Use the software supplied for your video subsystem to select video power management values.
Blank Screen	System only writes blanks to the video buffer.

- **Modem Use IRQ**

3,4,5,7,9,10,11,NA	For external modem, 3 or 4 will be used for card type modem. It is up to card definition. Default is 3.

- **Doze Mode**

After the selected period of system inactivity (1 Minute to 1 hour), the CPU clock runs at slower speed while all other devices still operate at full speed. The default value is “Disabled”.

Disabled	System will never enter doze mode
1/2/4/6/8/10/20/30/40 Min/1Hr	Defines the continuous idle time before the system entering DOZE mode.

- **Standby Mode**

After the selected period of system inactivity (1 minute to 1 hour), the fixed disk drive and the video shut off while all other devices still operate at full speed. The default value is “ Disabled”.

Disabled	System will never enter STANDBY mode
1/2/4/6/8/10/20/30/ 40Min/1Hr	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**

After the selected period of system inactivity (1 minute to 1 hour). All devices except the CPU shut off. The default value is “Disabled”.

Disabled	System will never enter SUSPEND mode
1/2/4/6/8/10/20/30/40/ Min/1 Hr	Defines the continuous idle time before the system entering SUSPEND mode. If any item defined in(J) is enabled & active, SUSPEND timer will be reloaded

- **HDD Power Down**

After the selected period of drive inactivity (1 to 15 minutes), the hard disk drive powers down while all other devices remain active. The default value is “Disabled”.

Disabled	HDD’S motor will nor power OFF.
1/2/3/4/5/6/7/8/9/10/1 1/12/13/14/15/Min	Defines the continuous HDD idle time before the HDD enters power saving mode (motor OFF)

4.7 PnP/PCI Configuration Setup

This section describes configuring the PCI bus system. PCI, or Personal Computer Interconnect, 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 (2A59GA39)
PNP/PCI CONFIGURATION
AWARD SOFTWARE, INC.

Resources Controlled By	: Manual	PCI IRQ Actived By	:Level
Reset Configuration Date	:Disabled	PCI IDE IRQ Map To	:PCI-AUTO
IRQ-3 assigned to	:PCI/ISA PnP	Primary IDE INT#	:A
IRQ-4 assigned to	:PCI/ISA PnP	Secondary IDE INT#	:B
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-13 assigned to	:PCI/ISA PnP		
IRQ-14 assigned to	:PCI/ISA PnP		
IRQ-15 assigned to	:PCI/ISA PnP		
IRQ-1 assigned to	:PCI/ISA PnP	ESC: Quit	↑ ↓ → ←:Select Item
IRQ-3 assigned to	:PCI/ISA PnP	F1 : Help	PU/PD/+/- :Modify
IRQ-5 assigned to	:PCI/ISA PnP	F5 : Old Values (Shift) F2 : Color	
IRQ-6 assigned to	:PCI/ISA PnP	F6 : Load BIOS Defaults	
IRQ-7 assigned to	:PCI/ISA PnP	F7 : Load Setup Defaults	

- **Resources 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), DMA assignment, and Used DMA fields disappear, as the BIOS automatically assigns them. The default value is “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 default value is “Disabled”.

- **PCI IDE IRQ Map To**

  This field lets you select PCI IDE IRQ mapping or PC AT (ISA) interrupts. If your system does not have one or two PCI IDE connectors on the system board, select values according to the type of IDE interface (s) installed in your system (PCI or ISA). Standard ISA interrupts for IDE channels are IRQ14 for primary and IRQ15 for secondary. The default value is “ PCI-AUTO”.

4.8 Integrated Peripherals

ROM PCI/ISA BIOS (2A59GA39)
INTEGRATED PERIPHERALS
AWARD SOFTWARE, INC.

IDE HDD Block Mode	:Enabled	
IDE Primary Master PIO	:Auto	
IDE Primary Slave PIO	:Auto	
IDE Secondary Master PIO	:Auto	
IDE Secondary Slave PIO	:Auto	
On-Chip Primary PCI IDE	:Enabled	
On-Chip Secondary PCI IDE	:Enabled	
PCI Slot IDE 2nd Channel	:Enabled	
USB Controller	:Enabled	
USB Keyboard Support	:Enabled	
Onboard FDC Co9ntroller	:Enabled	
Onboard UART 1	:3F8/IRQ4	ESC: Quit ↑ ↓ → ← :Select Item
Onboard UART2	:2F8/IRQ3	F1 : Help PU/PD/+/- :Modify
Onboard UART2 Mode	:Standard	F5 : Old Values (Shift)F2: Color
Onboard parallel port	:378/irq7	F6 : Load BIOS Defaults
Parallel Port Mode	:Normal	F7 : Load Setup Defaults

The four items related to the WDT describe the set up of the Watchdog Timer (WDT). Please refer to the Appendix for details.

- **IDE HDD Block Mode**

  Block mode is also called block transfer, multiple commands, or multiple sector read/write. If your IDE hard drive supports block mode (most new drives do), select Enabled for automatic detection of the optimal number of block read/writes per sector the drive can support. The default value is "Enabled'.

- **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. The default value is "Auto".

- **On-Chip Primary/Secondary PCI ZDE**

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

  NOTE: Choosing Disabled for these options will automatically remove the IDE Primary master/slave PIO and/or IDE Secondary Master/Slave PIO items on the menu.

- **USB Keyboard Support**

  Select Enabled if your system contains a USB controller and you have a USB keyboard. The default value is 'Disabled'.

- **Onboard FDC Controller**

  Select Enabled if your system has a floppy disk controller (FDC) installed on the system board and you wish to use it. If you install an add-in FDC or the system has no floppy drive, select Disabled in this field. The default value is 'Enabled'.

- **Onboard UART 1/2**

  Select an address and corresponding interrupt for the first and second serial ports. The default values are '3F8/IRQ4' for Onboard Serial Port 1 and '2F8/IRQ3' for Onboard Serial Port 2.

  NOTE: The UART Mode Select will not appear on the menu once you disable the setting of Onboard Serial Port 2.

When UART Mode Select is set as ASKIR or IrDA, the options RxD, TxD Active and IR Transmittion delay will appear.

- **Onboard Parallel Port**

  Select a logical LPT port name and matching address for the physical parallel (printer) port. The default value is '378/IRQ7".

  NOTE: Choosing Disabled for this option will remove the Parallel Port Mode option on the menu.

- **Parallel Port Mode**

  Select an operating mode for the onboard parallel (printer) port. Select Normal unless your hardware and software require one of the other modes offered in this field. The default value is 'SPP".

  NOTE: Selecting EPP on this option will allow selection to the EPP Mode (EPP1.7, EPP1.9) ECP mode selection will provide option for ECP Mode Use DMA. Choosing ECP+EPP modes will provide selections for both EPP Mode Select and ECP Mode Use DMA.

4.9 Supervisor/User Password Setting

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

I. Supervisor password: can enter and change the options of the setup menus.

2. 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 with eight characters at most, and press <Enter>. The password typed will now 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 disabled. Once the password is disabled, the system will boot and you can enter Setup freely.

PASSWORD DISABLED.

When a password is enabled, you have to type it every time you enter Setup. This prevents any unauthorized person from changing your system configuration.

Additionally when a password is enabled, you can also require the BIOS to request a password every time the system reboots. 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. If the Security option is set to "System", the password is required during boot up and entry into Setup. If set as "Setup", prompting will only occur prior to entering Setup.

4.10 IDE HDD Auto Detection

The Enhance IDE feature is included in all Award BIOS. The following is a brief description of this feature.

1. Setup Changes

<1> Auto-detection

BIOS setup will display all possible modes 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 appropriate for them.

ROM/PCI/ISA BOPS (2A59GA39)
CMOS SETUP UTILITY
AWARD SOFTWARE, INC.

HARD DISKS	TYPE	SIZE	CYLS	HEAD	PRECOMP	LANDZ	SECTOR	MODE
Primary Master :								

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
3	516	560	32	65535	1119	59	LARGE

<11> 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 0
Secondary Slave:	None 0	0	0	0	0	0 0

When HDD type is in 'user' type, the "MODE" option will be open for user to select 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. Cylinder	(1024)
x no. Head	(16)
x no. Sector	(63)
x no. per sector	(512)
	528 MB

If user sets his HDD to NORMAL mode, the maximum accessible HDD size will be 528MB even though its physical size may be greater than that!

- **LBA (Logical Block Addressing) mode**

  A new HDD accessing method to overcome the 528MB bottleneck. The number of cylinders, heads & 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 8.4GB which is obtained by the following formula:

	no Cylinder	(1024)
x	no. Head	(255)
x	no. Sector	(63)
x	bytes per sector	(512)
		814 GB

- **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 does not want LBA).

The Award BIOS provides another alternative to support these kinds of HDD!

CULS	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!

Maximum HDD size:

	no Cylinder	(1024)
x	no. Head	(255)
x	no. Sector	(63)
x	bytes per sector	(512)
	1 GB	

3. Remarks

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

4.11 Hard Disk Low Level Format Utility

The Award Low-Level-Format Utility is designed as a tool to our time formatting your hard disk. The utility automatically looks for the necessary information of the drive you selected. This 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	BAD TRACKS TABLE 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:	0	0	0	0	0	0	AUTO
Primary Slave:	0	0	0	0	0	0	AUTO

Up/Down – Select item Enter – Accept ESC – Exit/Abort

- **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. Listed 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 on the window at the right side of the screen.
  - **Add bad track**

    Directly type in the information of the known bad tracks on 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 on the window at the right side of the screen,
  - **Clear bad track table**

    Clear the whole bad track list on 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 I 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.

4.12 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 press the "RESET" button on the system case. You may also restart by simultaneously pressing the <Ctrl>, <Alt>, and <Delete> key's Upon restarting the system, immediately press <Insert> to load the BIOS default CMOS values for boot up.

Appendix A AWARD BIOS Check Point List

Following is the checkpoint list in AWARDBIOS in order of execution.

SELF-TEST INDICATORS

● ● ● ● ● ● ● ●

D7 D6 D5 D4 D3 D2 D1 D0

●: **LED is light**

○: **LED isn't light**

● ● ● ●: 0 ● ○ ● ●:4 ○ ● ● ●:8 ○ ○ ● ●:C

● ● ● ○: 1 ● ○ ● ○:5 ○ ● ● ○:9 ○ ○ ● ○:D

● ● ○ ●: 2 ● ○ ○ ●:6 ○ ● ○ ●:A ○ ○ ○ ●:E

● ● ○ ○: 3 ● ○ ○ ○:7 ○ ● ○ ○:B ○ ○ ○ ○:F

EXAMPLE

● ● ● ○ ○ ● ● ○

D7 D6 D5 D4 D3 D2 D1 D0

1 9

Check Point	Description
D0	NMI is Disabled. CPU ID saved. Init code Checksum verification starting.
D1	To do DMA init, Keyboard controller BAT test, start memory refresh and going to 4GB flat mod.
D3	To start Memory sizing
D4	To come back to real mode. Execute OEM patch. Set stack.
D5	E000 ROM enabled. Init code is copied to segment 0 and control to be transferred to segment 0.
D6	Control is in segment 0. To check <CTRL> <HOME> key and verify main BIOS checksum. If either <CTRL><HOME>is pressed or main BIOS checksum is bad, go to check point E0 else go to check point D7.

D7	To pass control to Interface Module.
D8	Main BIOS runtime code is to be decompressed.
D9	Control to be passed to main BIOS in shadow RAM.

Boot Block Recovery Code Check Points

E0	On Board Floppy Controller (if any) is initialized. To start bade 512K memory test.
E1	To initialize interrupt vector table.
E2	To initialize DMA and interrupt controllers.
E6	To enable floppy and timer IRQ. Enable internal cache.
ED	Initialize floppy drive.
EE	Start looking for a diskette in drive A: and read sector of the diskette.
F0	Start searching AWARDBOOT ROM file in root directory.
F1	‘AWARDBOOT ROM file not present in root directory.
F2	Start reading FAT table and analyze FAT to find the clusters occupied by MIBOOT. ROM file.
F3	Start reading FAT ‘AWARDBOOT. ROM’ file cluster by cluster.
F4	‘AWARDBOOT. ROM’file not of proper size.
F5	Disable internal cache.
FB	Detect Flash type present.
FC	Erase Flash.
FD	Program Flash.
FF	Flash program successful. BIOS is going to restart.

Runtime code is uncompressed in F000 shadow ram

LED display Description of Check point

●: LED is light

○: LED isn’t light

03	NMI is Disabled. To check soft reset/power-on.
05	BIOS stack set. Going to disable Cache if any.
06	POST code to be uncompressed.

07	CPU init and CPU data area init to be done.
08	CMOS checksum calculation to be done next.
0B	Any initialization before keyboard BAT to be done next.
0C	KB controller I/B free. To issue the BAT command to keyboard controller.
OE	Any initialization after KB controller BAT to be done next.
OF	Keyboard command byte to be written.
10	Going to issue Pin-23, 24 blocking/unblocking command.
11	Going to check pressing of <INS>, <END> key during power-on.
12	To init CMOS if" Init CMOS in every boot" is set or <END> key is pressed. Going to disable DMA and Interrupt controllers.
13	Video display is disabled and port-B is initialized. Chipset init about to begin.
14	8254 timer test about to start.
19	About to start memory refresh test.
1A	Memory Refresh line is toggling. Going to check 15us ON/OFF time.
23	To read 8042 input port and disable Megakey Green PC feature. Make BIOS code segment write able.
24	To do any setup before Int vector init.
25	Interrupt vector initialization about to begin. To clear password if necessary.
27	Any initialization before setting video mode to be done
28	Going for monochrome mode and color mode setting.
2A	Different BUSes init (system, static, output devices) to start if present. (Please see Appendix for details of different BUSes).
2B	To give control for any setup required before optional video ROM check.
2C	To look for optional video ROM and give control.
2D	To give control to do any processing after video ROM returns control.

2E	If EGA/VGA not found then do display memory R/W test.
2F	EGA/VGA not found. Display memory R/W test about to begin.
30	Display memory R/W test passed. About to look for the retrace checking.
31	Display memory R/W test or retrace checking failed. To do alternate Display memory R/W test.
32	Alternate Display memory R/W test passed. To look for the alternate display retrace checking.
34	Video display checking over. Display mode to be set.
37	Display mode set. Going to display the power on message.
38	Different BUSes init (input, IPL, general devices) to start if present. (Please see Appendix for details of different BUSes).
39	Display different BUSes initialization error messages. (Please see Appendix for details of different BUSES).
3A	New cursor position read and saved. To display the Hit <DEL> message.
40	To prepare the descriptor tables.
42	To enter in virtual mode for memory test.
43	To enable interrupts for diagnostics mode.
44	To initialize data to check memory wrap around at 0:0.
45	Data initialized. Going to check for memory wrap around at 0:0 and finding the total system memory size.
46	Memory wrap around test done. Memory size calculation over. About to go for writing patterns to test memory.
47	Pattern to be tested written in extended memory. Going to write patterns in base 640K memory.
48	Patterns written in base memory. Going to find out amount of memory below 1M memory.
49	Amount of memory below 1M found and verified. Going to find out amount of memory above 1M memory.
4B	Amount of memory above 1M found and verified. Check for soft

	reset and going to clear memory below 1M For soft reset. (If power on, go to check point# 4Eh).
4C	Memory below 1M cleared. (SOFT RESET) Going to clear memory above 1M.
4D	Memory above 1M cleared. (SOFT RESER) Going to save the memory size. (Go to check point #52h).
4E	Memory test started. (NOT SOFT RESET) About to display the first 64K memory size.
4F	Memory size display started. This will be updated during memory test. Going for sequential and random memory test.
50	Memor testing/initialization below 1M complete. Going to adjust displayed memory size for relocation/shadow.
51	Memory size display adjusted due to relocation/shadow. Memory testing above 1M to follow.
52	Memory testing/initialization above 1M complete. Going to save memory size information.
53	Memory size information is saved. CPU registers are saved. Going to enter in real mode.
54	Shutdown successful, CPU in real mode. Going to disable gate A20 line and disable parity/NMI.
57	A20 address line, parity/NMI disable successful. Going to adjust memory size depending one location/shadow.
58	Memory size adjusted for relocation/shadow. Going to clear Hit <DEL> message.
59	Hit <DEL> message cleared. <wait…>message displayed. About to start DMA and interrupt controller test.
60	DMA page register test passed. To do DMA#1 base register test.
62	DMA#1 base register test passed. To do DMA#2 base register test.
65	DMA#2 base register test passed, To program DMA unit 1 and 2.
66	DMA unit 1 and 2 programming over. To initialize 8259 interrupt

	controller.
7F	Extended NMI sources enabling is in progress.
80	Keyboard test started. Clearing output buffer, checking for stuck key, to issue keyboard reset command.
81	Keyboard reset error/stuck key found. To issue keyboard controller interface test command.
82	Keyboard reset error/stuck key found. To issue keyboard controller interface test command.
83	Command byte written, Global data init done. To check for lock-key.
84	Lock-key checking over. To check for memory size mismatch with CMOS.
85	Memory size check done. To display soft error and check for password or bypass setup.
86	Password checked. About to do programming before setup.
87	reset up complete. To uncompress SETUP code and execute CMOS setup.
88	Returned form CMOS setup program and screen is cleared. About to do programming after setup.
89	Programming after setup complete. Going to display power in screen message.
8B	First screen message displayed. <WAIT…> message displayed. PS/2 Mouse check and extended BIOS data area allocation to be done.
8C	Setup options programming after CMOS setup about to start.
8D	Going for hard disk controller reset.
8F	Hard disk controller reset done. Floppy setup to be done next.
91	Floppy setup complete. Hard disk setup to be done next.
92	Init of different BUSes optional ROMs from C800 to start. (Please see Appendix-I for details of different BUSes). See Appendix-I for details of different BUSes.
93	Going to do any init before C800 optional ROM control.

94	Any init before C800 optional ROM control is over. Optional ROM check and control will be done next.
95	Optional ROM control is done. About give control to do any required processing after optional ROM returns control and enable external cache.
96	Any initialization required after optional ROM test over. Going to setup timer data area and printer bade address.
9A	Returned after setting timer and printer base address. Going to set the RS-232 base address.
9B	Returned after RS-232 bade address. Going to do any initialization before Coprocessor test.
9C	Required initialization before Coprocessor is over. Going to initialize the Coprocessor next.
9D	Coprocessor initialized. Going to do any initialization after Coprocessor test.
9E	Initialization after Coprocessor test is complete. Going to check existed keyboard, keyboard ID and num-lock. Keyboard ID command to be
A2	Going to display any soft errors.
A3	Soft error display complete. Going to set keyboard typematic rate.
A4	Keyboard typematic rate set. To program memory wait states.
A5	Going to enable parity/NMI.
A7	NMI and parity enabled. Going to do any initialization required before giving control to optional ROM at E000.
A8	Initialization before E000 ROM control over. E0000 ROM to get control next.
A9	Returned from E000 ROM control. Going to do any initialization required after E000 optional ROM control.
AA	Initialization after E000 optional ROM Going to display the system configuration.
AB	To build MP table if needed.

AC	To uncompress DMI data and execute DMI POST init.
B0	System configuration is displayed.
B1	Going to copy any code to specific area.
0	Copying of code to specific area done. Going to give control to INT-19 boot loader.