

GA - 5486AL

USER'S MANUAL

1. Please enable " EDO, 60ns DRAM or 40MHz CLK " in chipset feature setup, if EDO DRAM or 60ns FP DRAM or DX2-80 or DX4-120 is installed for the best performance.
2. To get top performance, you may set
 - " DRAM Read Timing " to Fastest; **B**
 - " DRAM Write Timing " to Fastest; **B**
 - " SRAM Read Timing " to 2-1-1-1; **A**if your CPU is DX4-100 or AMD5x86-P75 133MHz or Cx5x86-100/133 and your DRAM speed is 60ns.

i GA-5486AL CPU VOLTAGE j

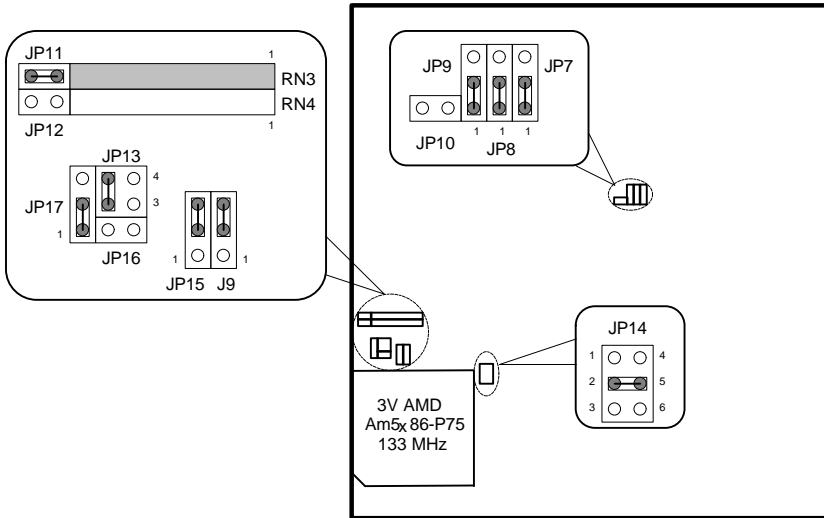
JP14	3.3V CPU	4V CPU	5V CPU
1-4		Close	
2-5	Close		
3-6			Close

PCI-Bus 486DX / DX2 / S-Series / OverDrive / P24D / P24T / DX4 Mainboard

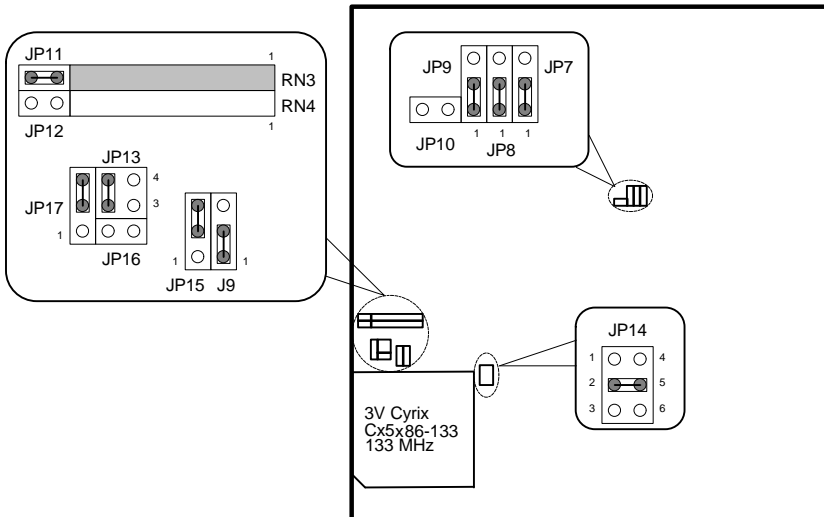
Rev. 1.2

Quick Installation Guide; **G**

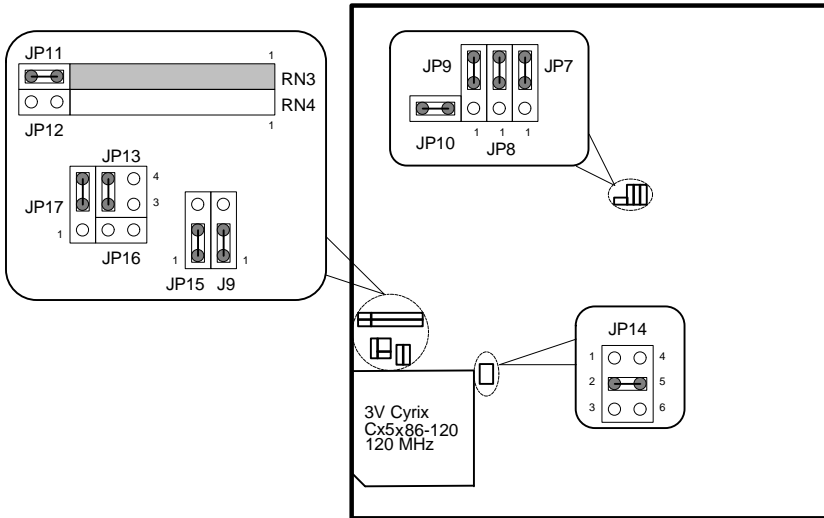
a) 3V AMD5x86-P75 133 MHz



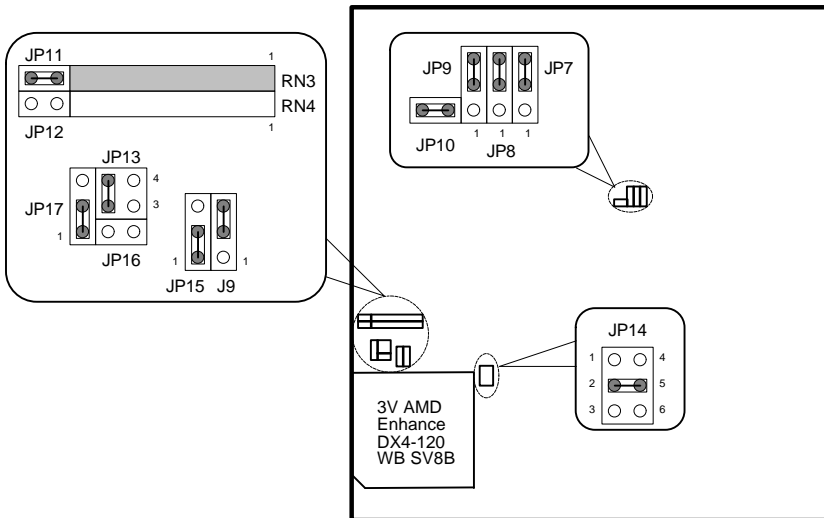
b) 3V Cyrix Cx5x86-133 133 MHz



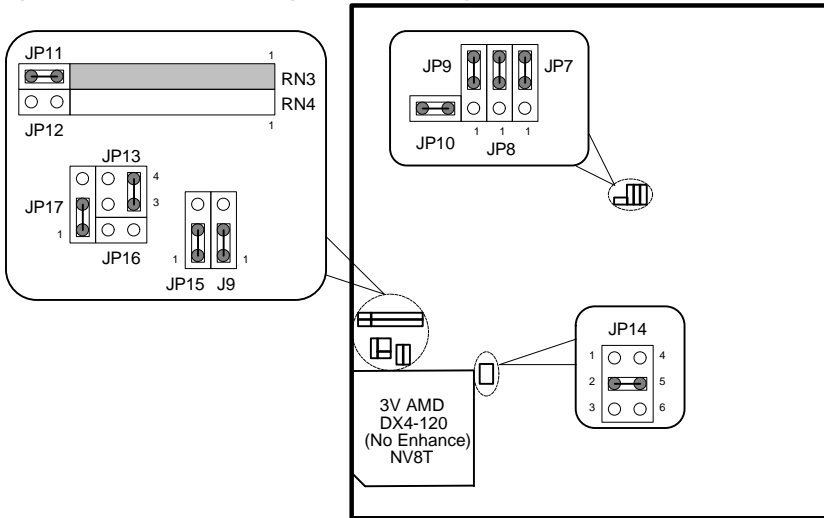
c) 3V Cyrix Cx5x86-120 120 MHz



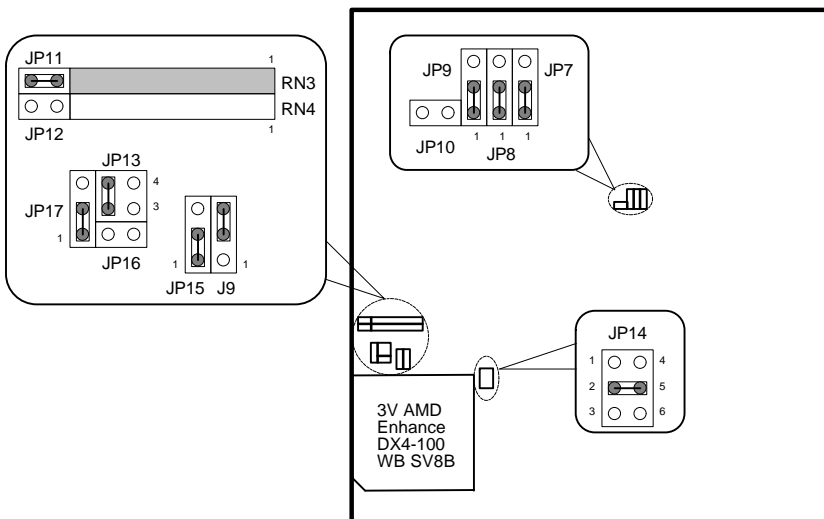
d) 3V AMD Enhance DX4-120 WB SV8B



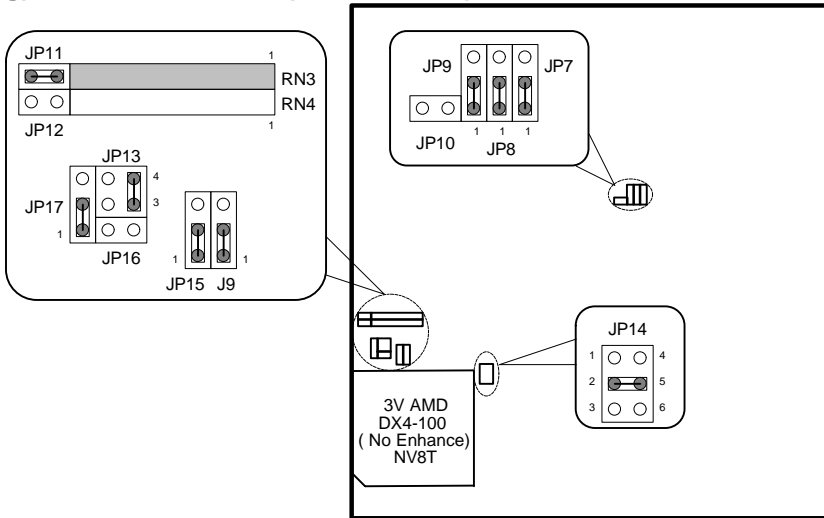
e) 3V AMD DX4-120 (No Enhance) NV8T



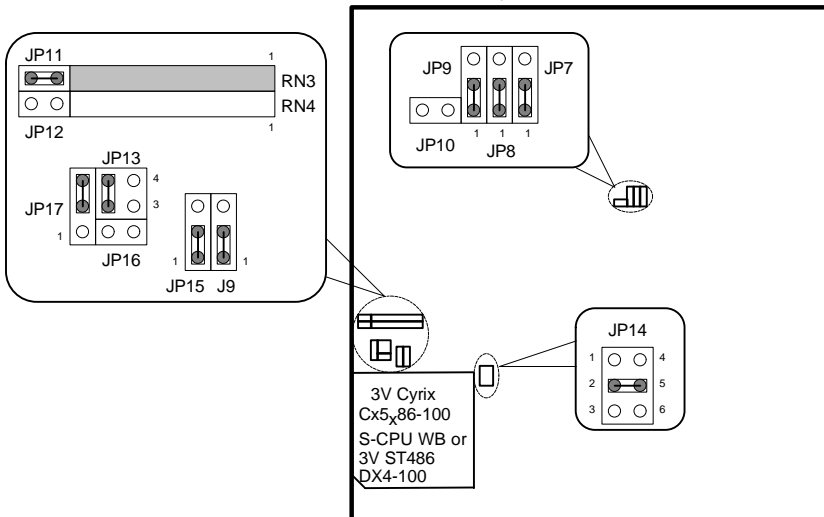
f) 3V AMD Enhance DX4-100 WB SV8B



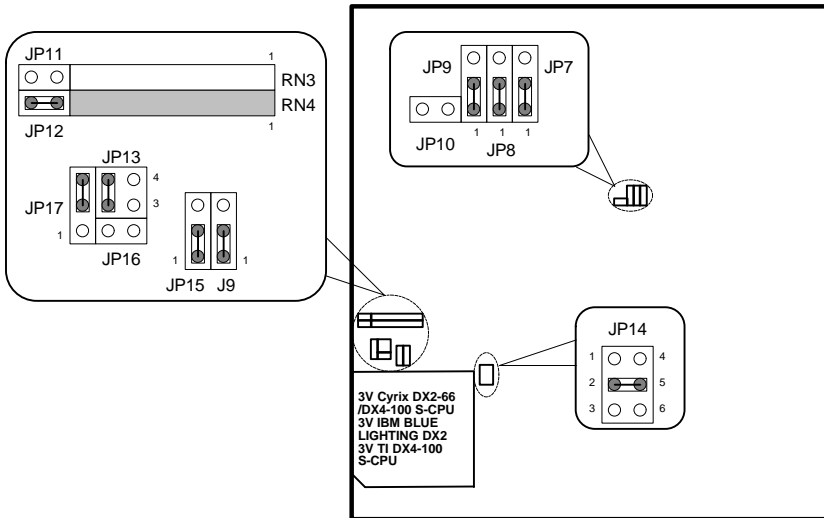
g) 3V AMD DX4-100 (No Enhance) NV8T



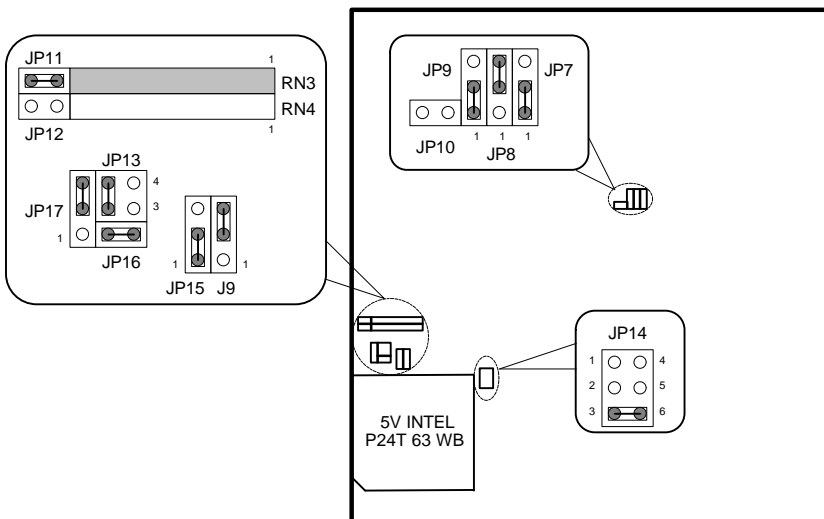
h) 3V Cyrix Cx5x86-100 S-CPU WB ; 3V ST486 DX4-100



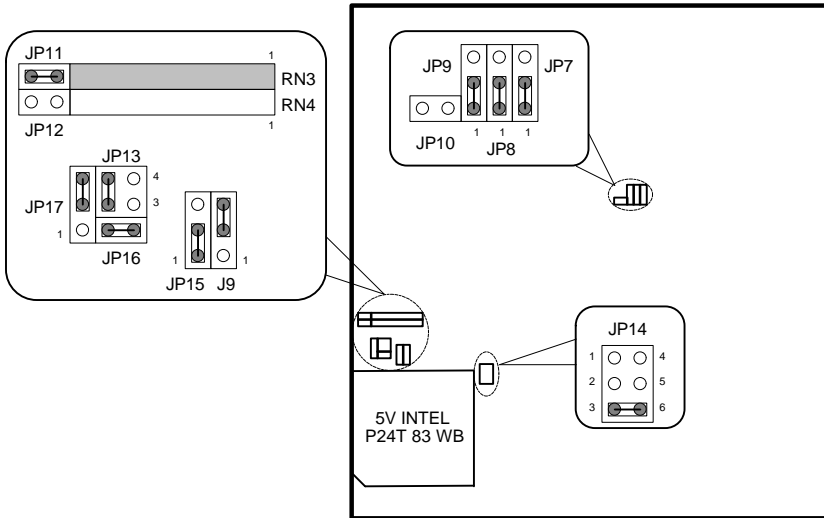
i) 3V Cyrix DX2-66/DX4-100 S-CPU ; 3V IBM BLUE LIGHTING DX2 ; 3V TI DX4-100 S-CPU



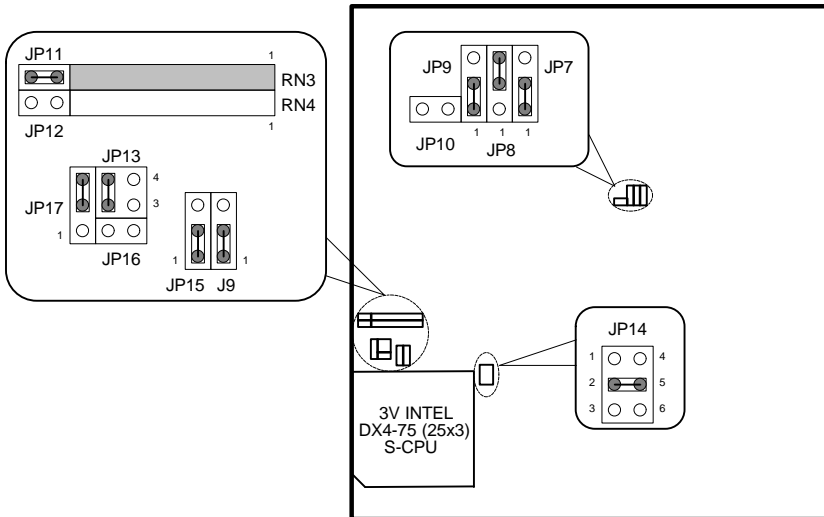
j) 5V INTEL P24T 63 WB



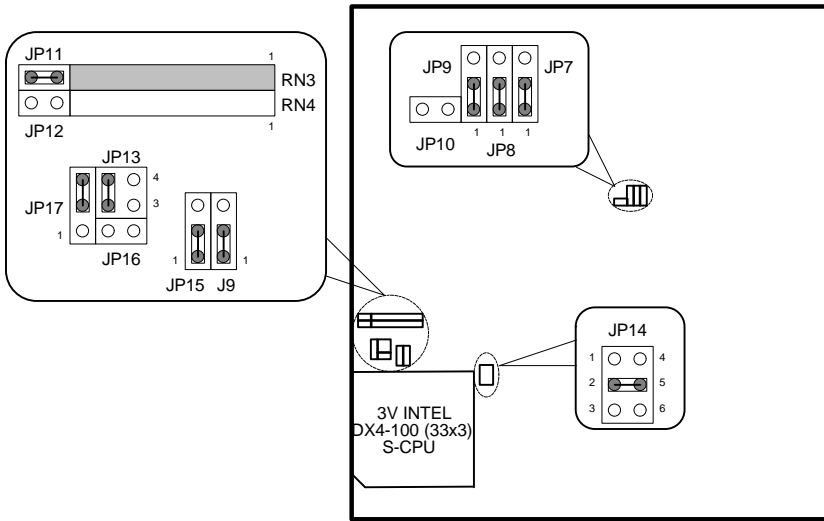
k) 5V INTEL P24T 83 WB



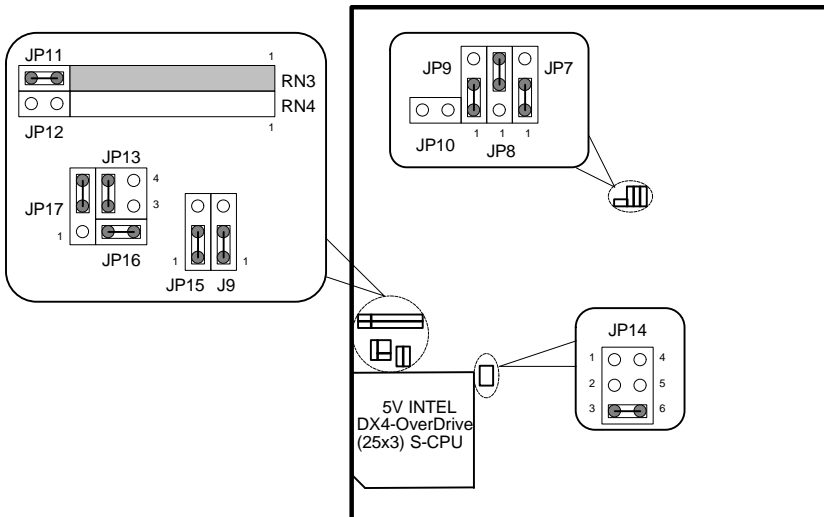
I) 3V INTEL DX4-75 (25x3) S-CPU



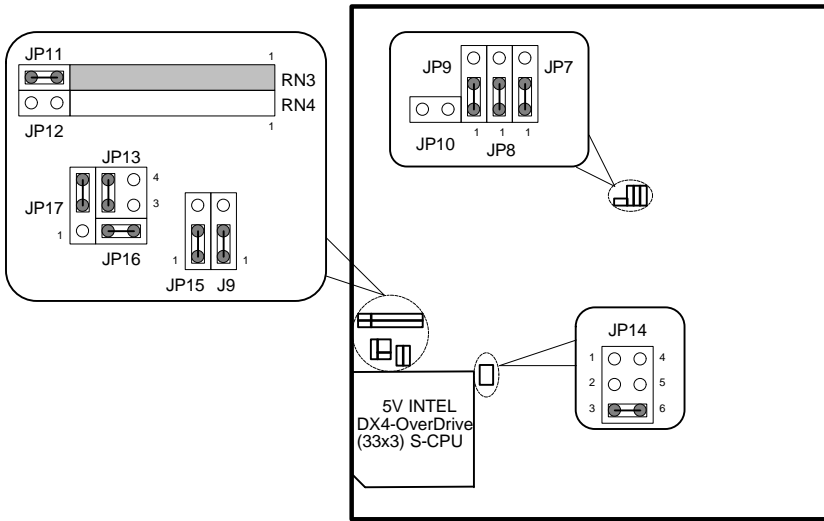
m) 3V INTEL DX4-100 (33x3) S-CPU



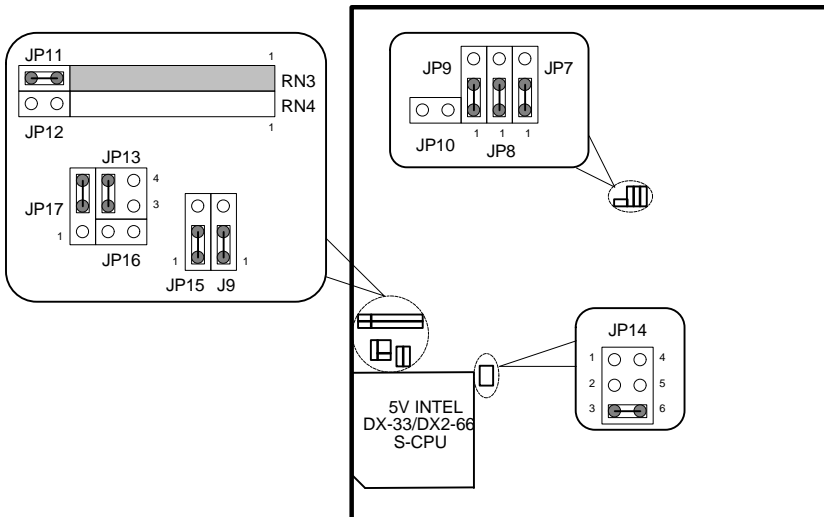
n) 5V INTEL DX4-OVERDRIVE (25x3) S-CPU



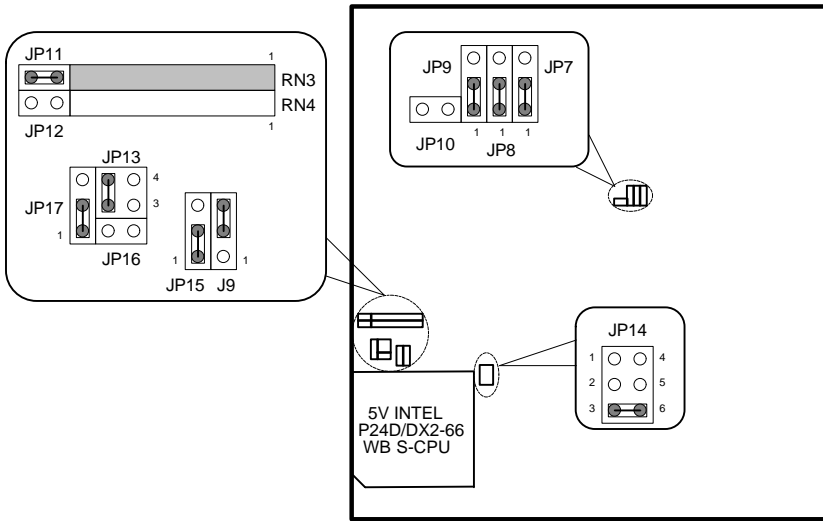
o) 5V INTEL DX4-OVERDRIVE (33x3) S-CPU



p) 5V INTEL DX-33 / DX2-66 S-CPU



q) 5V INTEL P24D / DX2-66 WB S-CPU



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1 INTRODUCTION

1.1 PREFACE

Welcome to use the **GA-5486AL** motherboard. The motherboard is a 128 KB - 512 KB CACHE 5x86 & 486DX series PC/AT compatible system with ISA bus, PCI (Peripheral Component Interconnect) bus and has been designed to be the fastest 5x86 & 486 PC/AT system and the GREEN FUNCTION (Power-Down Mode) had been added. There are some new features allowing you to operate the system with just the performance you want.

This manual also explains how to install the motherboard for operation, and how to set up your CMOS CONFIGURATION with BIOS SETUP program.

1.2 KEY FEATURES

- 5x86 & 80486 based PC/AT compatible mainboard with ISA and PCI Bus.
- Supports 3 Master PCI bus slots .
- Supports AMD5x86 / Cx5x86 / 486DX / DX2 / S-Series / OverDrive / P24D / P24T / DX4 running at 25 - 133 MHz.
- Supports True Green Function.
- Supports Intel, AMD, Cyrix, TI, IBM CPU.
- Supports 237 pin (Socket 3) ZIF White socket / LIF socket on board.
- Supports 128 / 256 / 512 KB 2nd cache memory operated in BURST mode.
- Write-Back cache operation.
- Supports 2 - 128 MB DRAM memory on board.
- Supports 2 channels Enhance PCI IDE ports for 4 IDE Devices.
- Supports 2xCOM (16550) ports, 1xLPT (EPP / ECP) port, 1 Floppy port.
- Supports shadow RAM for BIOS & VIDEO BIOS.
- Supports shadow RAM cacheable function to improve performance.
- Supports Hardware & Software speed change function.
- Licensed AWARD BIOS.
- 2/3 Baby AT size (22 cm x 21 cm) with 4 AT slots and 3 PCI slots .

1.3 PERFORMANCE LIST

GA-5486AL

The following performance data list is the testing results with some popular benchmark testing programs. These data are just reference for users and there is no responsibility for different testing data values gotten by users.(The different H/W & S/W configuration will result in different benchmark testing results.)

System Benchmarks At DOS Environment with IDE Controller

- CPU : AMD5x86-133/ Cx5x86-100/ DX4-100 OVER/ Cx5x86-133/ AMD DX4-100 WB/ Cyrix DX4-100/ P24T-63
- DRAM : 8 MB / 60ns 2pcs. Total memory 16MB
- CACHE : 256KB
- VGA : ATI mach 64V
- H.D. : Quantum (1GB)
- O.S. : MS DOS V6.22

```

• Autoexec.bat:          • Config.sys:
C:\DOS\SMARTDRV.EXE    device = c:\alihdd\alihdd.sys /t /s33 /bios:yyyy /drive:hnnn /PIO:aaaa /bkm:yyyy /
/X
@ECHO OFF              DEVICE = C:\DOS\SETVER.EXE
PROMPT $p$g            DEVICE = \WINDOWS\HIMEM.SYS
PATH C:\;C:\DOS        DOS = HIGH
SET TEMP = C:\DOS      FILES = 30
                        DEVICE = C:\WINDOWS\IFSHLP.SYS
                        STACK = 9,256
    
```

<256K>

Software	Item	Unit	Cx5x86-133	AMD5x86-133	Cx5x86-100	DX4-100 OVER
LandMark Speed V2.0	CPU	MHz	565.13	447.09	423.85	364.11
	FPU	MHz	1415.36	1092.82	1061.50	820.42
Norton SI V8.0	CPU	index	352.7	288.7	264.5	198.5
Power Meter V1.81	MIPS	Mips	65.0	57.3	48.7	40.6
PC Bench mark V9.0	DOS Mark	index	761.97	701.37	678.32	632.94
	CPU mark 16	index	150.09	129.85	126.30	119.19
Winstone 95	640 X 480 X 256		155.2	145.5	136.7	129

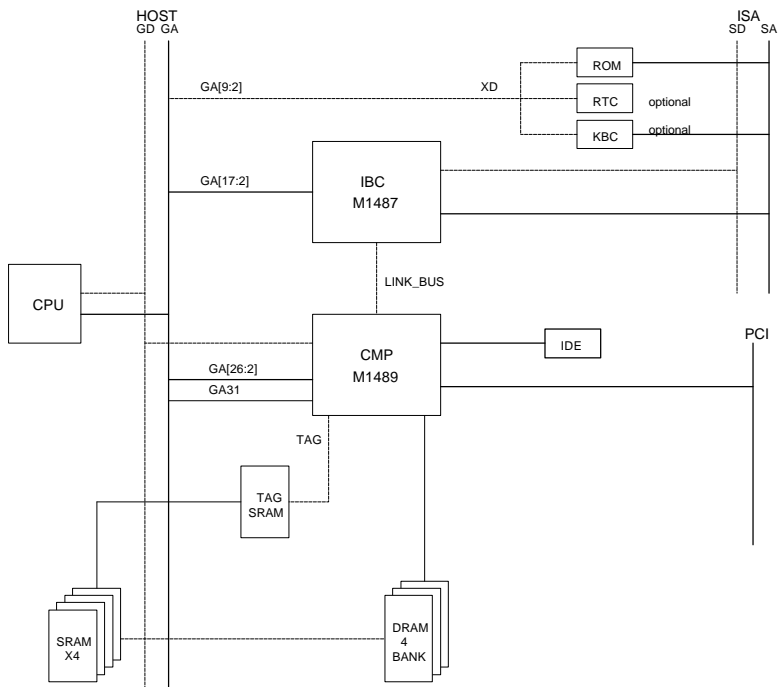
Software	Item	Unit	P24T-63	AMD DX4-100 WB	Cyrix DX4-100
LandMark Speed V2.0	CPU	MHz	361.42	335.30	330.63
	FPU	MHz	1040.46	819.60	868.54
Norton SI V8.0	CPU	index	198.5	216.5	170.1
Power Meter V1.81	MIPS	Mips	39.8	43.8	39.4
PC Bench mark V9.0	DOS Mark	index	586.49	582.47	574.98
	CPU mark 16	index	116.37	105.01	103.25
Winstone 95	640 X 480 X 256		122.3	118.6	111.4

<EDO RAM NON-CACHE>

Software	Item	Unit	Cx5x86-133	AMD5 _x 86-133	Cx5 _x 86-100	DX4-100 OVER
LandMark Speed V2.0	CPU	MHz	565.16	447.11	423.86	363.92
	FPU	MHz	1415.48	1092.90	1061.85	818.52
Norton SI V8.0	CPU	index	352.7	288.7	264.6	198.5
Power Meter V1.81	MIPS	Mips	65.0	58.2	48.7	34.5
PC Bench mark V9.0	DOS Mark	index	726.90	677.56	645.49	553.44
	CPU mark 16	index	129.17	118.86	111.41	90.83
Winstone 95	640 X 480 X 256		149.3	141.9	132.8	116.4

Software	Item	Unit	P241-63	AMD DX4-100 WB	Cyrix DX4-100
LandMark Speed V2.0	CPU	MHz	361.48	335.32	330.63
	FPU	MHz	1040.64	819.64	868.58
Norton SI V8.0	CPU	index	198.5	216.5	170.1
Power Meter V1.81	MIPS	Mips	41.0	44.3	39.4
PC Bench mark V9.0	DOS Mark	index	603.5	554.12	548.18
	CPU mark 16	index	116.01	97.21	93.32
Winstone 95	640 X 480 X 256		122.1	111.9	105.1

1.4 BLOCK DIAGRAM



<Figure 1.1>

1.5 INTRODUCE THE PCI-BUS

Connecting devices to a local bus of CPU can dramatically increase the speed of I/O-bound peripherals with only a slight increase in cost over traditional systems. This price/performance point has created a vast market potential for local bus products. The main barrier to this market has been the lack of an accepted standard for local bus peripherals.

The PCI-bus standard, under development since Jun. 1992, which is designed to bring workstation-level performance to standard PC platform. The PCI-bus removes many of the bottlenecks that have hampered PC for several years. On the PCI-bus, peripherals operate at the native speed of the computer system, thus enabling data transfer between peripherals and the system at maximum speed. This performance is critical for bandwidth-constrained devices such as video, multimedia, mass storage and networking adapters.

PCI-bus standard provide end-users with a low-cost, extendible and portable local bus design, which will allow systems and peripherals from different manufacturers to work together.

2 SPECIFICATION

2.1 HARDWARE

- CPU
 - AMD5x86 / Cx5x86 / 80486DX / DX2 / S-Series, OverDrive, P24D, P24T, DX4.
 - 237 pins (Socket 3) ZIF white socket / LIF socket on board.
- COPROCESSOR
 - Coprocessor included in 80486DX.
- SPEED
 - 25 / 33 / 40 MHz system
 - 20-33 MHz PCI- bus speed.
 - 8 MHz (programmable) AT Bus speed.
 - Hardware and Software speed switchable function.
- GREEN FUNCTION
 - Power Down Timer from 10 sec to 1 hr.
 - When enter Power Down Mode, 0 MHz system speed for Intel & Cyrix S-Series.
 - Support IDE Hard Disk Standby Mode control.
 - Wake Up by all IRQ, DMA, and PCI Master Devices.
 - Support Green LED Indicator and Green Switch.
- DRAM MEMORY
 - 4 banks 72 pins single side SIMM module or 2 banks 72 pins double side SIMM module.
 - Use 1 / 2 / 4 / 8 / 16 / 32 / 64 MB 60~70 ns SIMM module DRAM.
 - Support Fast Page DRAM access mode & EDO.
- CACHE MEMORY
 - 8 KB cache memory included in 80486 DX / DX2 / SX2 and AMD DX4.
 - 16 KB cache memory included in AMD5x86, Cx5x86, INTEL DX4.
 - 128 / 256 / 512 KB 2nd cache memory on board.
 - Support 486 Burst mode on 2nd cache memory access.
- SHADOW RAM
 - Main BIOS shadow function programmable.
 - Video BIOS shadow function programmable.
 - Shadow RAM cacheable function programmable.
- IDE PORTS
 - 2 Enhanced IDE channels on board.(Using IRQ14,15)
 - Support Mode 3, 4 IDE & ATAPI CD-ROM.
 - Driver Support DOS, WINDOWS, OS/2, NT, Novell.
- I/O PORTS
 - Supports 2 16550 COM ports. (Using IRQ4,3)
 - Supports 1 EPP/ECP LPT port. (Using DMA3 & IRQ7)
 - Supports Floppy port. (Using DMA2 & IRQ6)
- I/O BUS SLOTS
 - 4 AT-bus.
 - 3 PCI-bus.
- DIMENSION
 - 2/3 Baby AT size (22 cm x 21 cm).

2.2 SOFTWARE

- BIOS
 - Licensed AWARD BIOS.
 - AT CMOS Setup, Advanced / Chipset Setup and Power Management included.
- O. S.
 - Operation with MS-DOS, WINDOWS NT, OS/2, NOVELL, SCO UNIX.

2.3 ENVIRONMENT

- AMBIENT TEMP.
 - 0°C to +50°C (operating).
- RELATIVE HUM.
 - 0 to +85% (operating).
- ALTITUDE
 - 0 to 10,000 feet (operating).
- VIBRATION
 - 0 to 1,000 Hz.
- ELECTRICITY
 - 4.9 V to 5.2 V.
 - 3 A to 5 A current.

3 HARDWARE INSTALLATION

3.1 UNPACKING

The mainboard package should contain the following:

- The **A-5486AL** mainboard
- User's manual
- A Driver Diskette

The mainboard contains sensitive electric components which can be easily damaged by static electricity, so the mainboard should be left in its original packing until it is installed.

Unpacking and installation should be done on a grounded anti-static mat. The operator should be wearing an anti static wristband, grounded at the same point as the anti-static mat.

Inspect the mainboard carton for obvious damage. Shipping and handling may cause damage to your board. Be sure there are no shipping and handling damages on the board before proceeding.

After opening the mainboard carton, extract the system board and place it only on a grounded anti-static surface component side up. Again inspect the board for damage. Press down on all of the socket IC's to make sure that they are properly seated. Do this only on with the board placed on a firm flat surface.

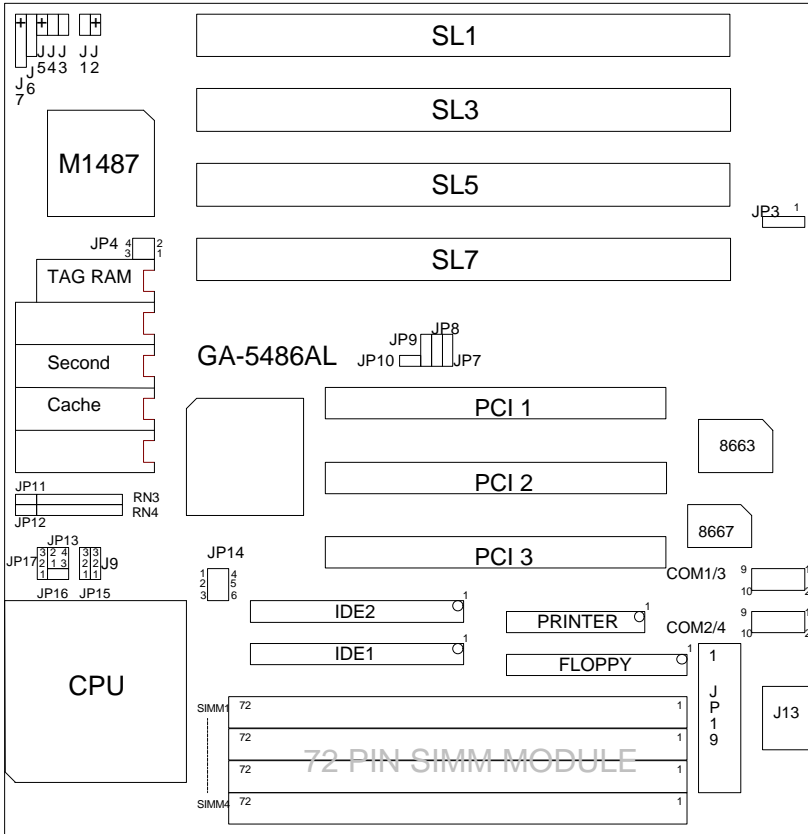
⚡ **Do not apply power to the board if it has been damaged..**

You are now ready to install your mainboard. The mounting hole pattern on the mainboard matches the IBM-XT system board. It is assumed that the chassis is designed for a standard IBM XT/AT mainboard mounting.

Place the chassis on the anti-static mat and remove the cover. Take the plastic clips, Nylon stand-off and screws for mounting the system board, and keep them separate.

3.2 MAINBOARD LAYOUT

<Figure 3.1>



3.3 JUMPERS AND CONNECTORS SETTING

• CONNECTOR SETTING

♦ J3: Reset Connector	
Open	Normal operation.
Close	Hardware reset system.

♦ J4: Turbo Switch Connector	
Close	Low speed.
Open	High speed. (Default)

♦ J6: Speaker Connector	
1	Data.
2	GND.
3	GND.
4	VCC (+5V).

♦ J7: Power LED & Key-Lock Connector	
1	LED anode (+).
2	NC.
3	LED cathode (-).
4	Key-lock.
5	GND.

♦ J2: HDD LED (On board layout, "+" is LED anode)	
	Hard disk Read/Write indicator.

♦ J13: Keyboard Connector	
1	Keyboard clock.
2	Keyboard data.
3	NC.
4	VCC (+5V).
5	GND.

♦ JP19: Power Supply Connector	
1	Power good signal.
2,10,11,12	VCC (+5V).
3	+12V.
4	-12V.
5,6,7,8	GND.
9	-5V.

• GREEN FUNCTION JUMPER SETTING

♦ J5: Turbo LED and Flash Green LED (On board layout, "+" is LED anode)	
	Normally, this jumper is for Turbo LED. But when system gets into Green mode, the LED on this jumper will light once per second.

♦ J1: Brake Switch	
	Shorting this jumper and then releasing it immediately will force system into Green mode right away.

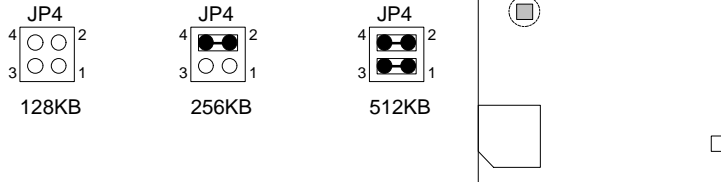
3.4SRAM INSTALLATION AND JUMPERS SETUP

The cache memory system consists of two parts, one is TAG SRAM, the other is DATA SRAM. The TAG SRAM type used in this mainboard is 8Kx8, 16Kx8, 32Kx8 and the DATA SRAM type is 32Kx8-15ns 64Kx8-15ns or 128Kx8-15ns.

The mainboard can be installed with 128, 256, 512 KB cache memory when using 32Kx8 or 64Kx8 or 128Kx8 type DATA SRAM respectively.

• CACHE MEMORY SIZE SETTING

	Size	128K	256K	512K
JP4	2-4	OPN	SHT	SHT
JP4	1-3	OPN	OPN	SHT
DATA SRAM		32K8 4 pcs	64K8 4 pcs	128K8 4 pcs
TAG SRAM		8K8	16K8	32K8



3.5 CPU INSTALLATION AND JUMPERS SETUP

The CPU is a sensitive electric component and it can be easily damaged by static electricity, so users must keep it away from metal surface when the CPU is installed onto mainboard.

When the user installs the CPU on socket, please notice the PIN 1 of CPU is in the same corner as the PIN 1 of socket!

Before the CPU is installed, the mainboard must be placed on a flat plane in order to avoid being broken by the pressure of CPU installation.

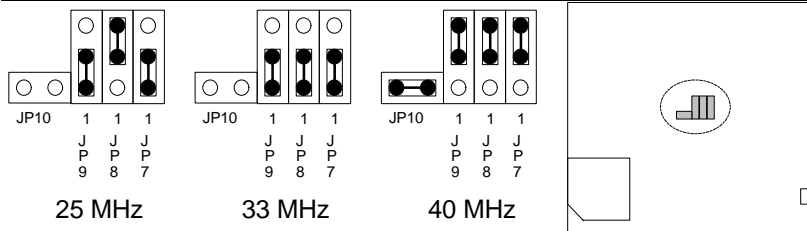
- CPU CLOCK SETTING

The system speed depends on the frequency of CLOCK GENERATOR. The user can change the clock selection jumper to set up the system speed at 25, 33, 40MHz for different CPU speeds.

The mainboard can use AMD5x86, Cx5x86, 80486DX, DX2, OverDrive, P24T, P24D and DX4 CPU, and the CPU speed must match with the frequency of CLOCK GEN. It will cause system hanging up if the CLOCK GEN.'S frequency is higher than CPU's.

Refer to the following table to set up the CPU clock:

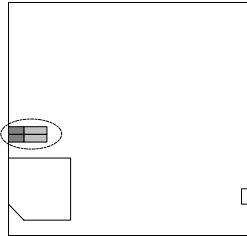
Clock	CPU speed	JP7	JP8	JP9	JP10
25 MHz	25/50/75 MHz	1-2	2-3	1-2	Open
33 MHz	33/66/100/133 MHz	1-2	1-2	1-2	Open
40 MHz	40/80/120 MHz	2-3	2-3	2-3	Short



- CPU BRAND SELECTION

BRAND	JP11	JP12	RN3	RN4
5x86, Intel, AMD, UMC	Installed		Installed	
Cyrix DX2-66, DX2-80, DX4-100		Installed		Installed

CPU BRAND SELECTION



• CPU TYPE SELECTION

◆ JP15:

1-2	Intel DX4, Enhance AMD X 3, AMD5x86 X 3, Cx5x86 X 3
2-3	Intel DX4, Enhance AMD X 2, AMD5x86 X 4, Cx5x86 X 4

◆ JP17:

1-2	P24D,Enhance AMD AMD5x86 WB & Non-Enhance AMD X 3
2-3	P24D,Enhance AMD AMD5x86 WT & Non-Enhance AMD X 2

◆ J9:

1-2	Normal
2-3	P24D WB & AMD Enhance WB & AMD5x86 & P24T

◆ JP16:

Close	Intel Over Drive
Open	Normal

◆ JP13:

1-2	SCPU
3-4	Non-SCPU

• CPU VOLTAGE SELECTION

i GA-5486ALj j

JP14	3.3V CPU	4V CPU	5V CPU
1-4		Close	
2-5	Close		
3-6			Close

3.6 DRAM INSTALLATION

This mainboard can be installed with 1, 2, 4, 8, 16, 32 or 64 MB EDO or FAST PAGE 72 pins SIMM module DRAM. The DRAM speed of both mainboard is using 60/70 ns. The banks of memory system on the mainboard includes from SIMM 1 to SIMM 4.

2 banks for double side SIMM module.

4 banks for single side SIMM module.

The DRAM installation position refer to MAINBOARD LAYOUT, and notice the PIN -1 of SIMM module must match with the PIN -1 of SIMM socket when the DRAM SIMM module is installed.

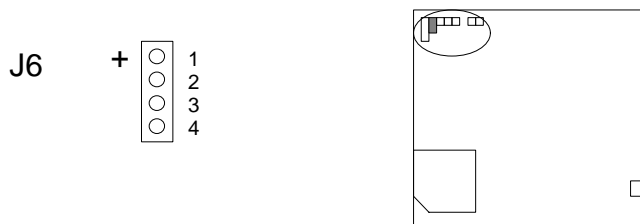
Insert the DRAM SIMM module into the SIMM socket at 45 degree angle. If there is a wrong direction of PIN -1, the DRAM SIMM module couldn't be inserted into socket completely. After completely insert SIMM module into socket, then press the SIMM module in vertical direction until the left and right metal holders can keep the SIMM module standing up con-firmly.

DRAM Installation Guide

Total Memory	Bank 0	Bank 1	Bank 2	Bank 3
4 MB	4 MB			
8 MB	8 MB			
8 MB	4 MB	4 MB		
12 MB	8 MB	4 MB		
16 MB	16 MB			
16 MB	8 MB	8 MB		
16 MB	4 MB	4 MB	4 MB	4 MB
20 MB	16 MB	4 MB		
24 MB	16 MB	4 MB	4 MB	
24 MB	16 MB	8 MB		
32 MB	32 MB			
32 MB	16 MB	16 MB		
64 MB	16 MB	16 MB	16 MB	16 MB
64 MB	32 MB	32 MB		

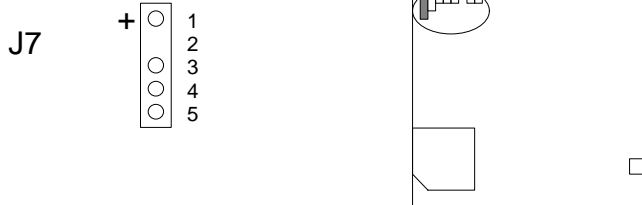
3.7 SPEAKER CONNECTOR INSTALLATION

There is always a speaker in AT system for sound purpose. The 4-Pins connector (J6) is used to connect speaker. The speaker can work well in both direction of connector when it is installed to the connector (J6) on mainboard.



3.8 POWER LED & KEY LOCK CONNECTOR INSTALLATION

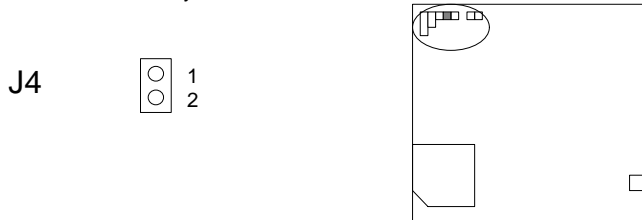
There are a system power LED lamp and a key on the panel of case. The power LED will light on when system is powered-on, and the key can lock the keyboard input or unlock it, both of them are connected to a 5 PIN connector. The connector should be installed to J7 of mainboard in correct direction.



3.9 TURBO SWITCH CONNECTOR INSTALLATION

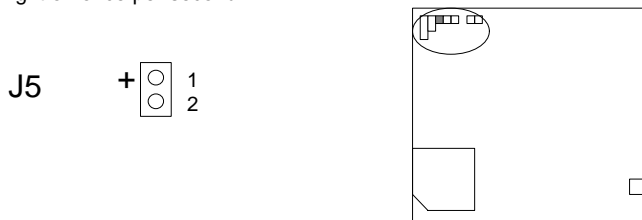
The TURBO switch on the panel is used for controlling the system speed. Some program developed on XT should be executed with a low speed system, so a high speed system needs the speed switching function to change its running speed.

Because a 80486 CPU cannot accept the real clock speed change when program is executed, so the mainboard uses cache-enable or disable function to simulate TURBO switching function. The J4 on mainboard should be connected to the TURBO switch on panel, and user can push in or pop out the TURBO switch to enable or disable the cache function of system.



3.10 TURBO LED FLASH GREEN LED CONNECTOR INSTALLATION

The TURBO LED on panel can indicate the current speed status of system. The TURBO LED connector should be installed to J5 in correct direction. Normally, the J5 is a TURBO LED connector. But when system gets into Green mode, the LED on J5 will light on once per second.

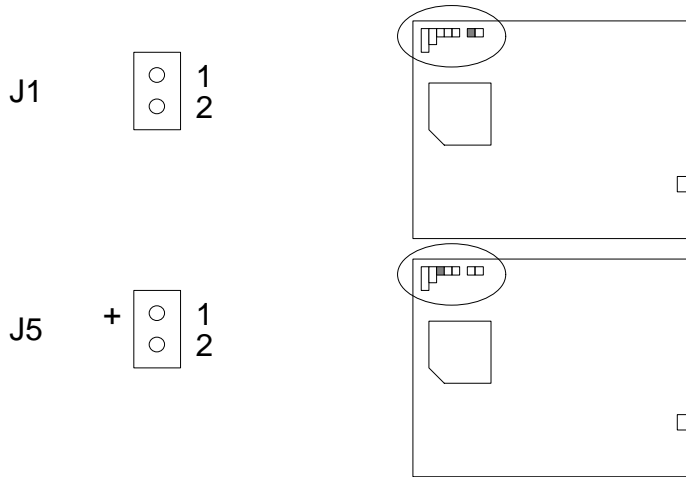


3.11 HARDWARE RESET SWITCH CONNECTOR INSTALLATION

The Reset switch on panel provides users with Hardware Reset function which is almost the same as power on / off. The system will do a cold start after the Reset switch is pushed and released at once. The Reset switch is a 2 PIN connector and should be installed to J1 on mainboard.

3.12 GREEN FUNCTION INSTALLATION

For the purpose of power saving, there are two jumpers J5 and J1, to make sure the power saving function doing well. The J5 is a indicator (Green LED) for Green function. If the green LED is FLASH, the system is operating in green mode. The J1 is a switch to force the system into Green mode immediately.



3.13 PERIPHERAL DEVICE INSTALLATION

If a PCI-bus device is to be installed in the system, any one of three PCI-bus slots can be used no matter what Slave or Master PCI-bus device being installed.

After the peripheral device installed, the user should check everything again, and prepare to power-on the system. Now, the mainboard can be mounted into the case and fixed with screws.

4 BIOS CONFIGURATION

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 CMOS SRAM so that it retains the Setup information when the power is turned off.

4.1 ENTERING SETUP

Power ON the computer and press 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 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 press <Ctrl>,<Alt>,and 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

4.2 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
F2 key	Change color from total 16 colors
F3 key	Calendar, only for Status Page Setup Menu
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 default
F8 key	Reserved
F9 key	Reserved
F10 key	Save all the CMOS changes, only for Main Menu

4.3 GETTING HELP

4.3.1 Main Menu

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

4.3.2 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 highlight item. To exit the Help Window press <Esc>.

4.4 THE MAIN MENU

Once you enter Award BIOS CMOS Setup Utility, the Main Menu (Figure 4.1) 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 CMOS SETUP UTILITY AWARD SOFTWARE, INC.	
STANDARD CMOS SETUP BIOS FEATURES SETUP CHIPSET FEATURES SETUP POWER MANAGEMENT SETUP PCI CONFIGURATION SETUP LOAD BIOS DEFAULTS LOAD SETUP DEFAULTS	SUPERVISOR PASSWORD USER PASSWORD IDE HDD AUTO DETECTION HDD LOW LEVEL FORMAT SAVE & EXIT SETUP EXIT WITHOUT SAVING
ESC : Quit F10 : Save & Exit Setup	↑ ↓ → ← : Select Item (Shift)F2 : Change Color
Time, Date, Hard Disk Type ...	

Figure 4.1: Main Menu

- Standard CMOS setup
This setup page includes all the items in a standard compatible BIOS.
- BIOS features setup
This setup page includes all the items of Award special enhanced features.
- Chipset features setup
This setup page includes all the items of chipset special features.
- Power Management Setup
This setup page includes all the item of power management features.
- PCI Configuration Setup
This setup page includes all the configurations of PCI slots parameters.
- Load BIOS Defaults
BIOS defaults indicates the most appropriate value of the system parameter which the system would be on more safety operation.
- Load SETUP Defaults
SETUP defaults indicate the most appropriate value of the system parameter which the system would be in maximum performance.
- Supervisor Password
Change, set, or disable password. It allows you to limit access to the system and Setup, or just to Setup.
- User Password
Change, set, or disable password. It allows you to limit access to the system.
- IDE HDD auto detection
Automatically configure hard disk parameter.
- HDD low level format
Low level format IDE Hard Disk.
- Save & exit setup
Save CMOS value changes to CMOS and exit setup.
- Exit without save
Abandon all CMOS value changes and exit setup.

4.5 STANDARD CMOS SETUP MENU

The items in Standard CMOS Setup Menu (Figure 4.2) are divided into 11 categories. Each category includes none, one or more than one setup items. Use the arrows 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
STANDARD CMOS SETUP
AWARD SOFTWARE, INC.

Date (mm:dd:yy) : Fri, Oct 20 1995	
Time (hh:mm:ss) : 16 : 12 : 00	
HARD DISKS	TYPE SIZE CYLS HEAD PRECOMP LANDZ SECTOR MODE
Primary Master	: None 0 0 0 0 0 0 -----
Primary Slave	: None 0 0 0 0 0 0 -----
Second Master	: None 0 0 0 0 0 0 -----
Second Slave	: None 0 0 0 0 0 0 -----
Drive A : 1.44 M, 3.5 in.	Base Memory: 640 K Extended Memory: 7168 K Other Memory: 384 K <hr/> Total Memory: 8192 K
Drive B : None	
Video : EGA/VGA	
Halt On : No Errors	
ESC : Quit ↑ ↓ → ← : Select Item PU/PD/+/- : Modify F1 : Help (Shift)F2 : Change Color	

Figure 4.2: STANDARD CMOS SETUP

- **Date**

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

day	The day, from Sun to Sat, determined by the BIOS and is display-only
date	The date, from 1 to 31 (or the maximum allowed in the month)
month	The month, Jan. through Dec.

year	The year, from 1900 through 2099
------	----------------------------------

- **Time**

The time format is <hour> <minute> <second>. The time is calculated based on the 24-hour military-time clock. For example, 1 p.m. is 13:00:00.

- **Primary Master / Slave, Secondary Master / Slave**

The category identify the types of hard disk drive C or drive F 4 devices that has been installed in the computer. There are 46 pre-defined types and a user definable type. Type 1 to Type 46 are pre-defined. 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>. Those information should be provided in the documentation form your hard disk vendor or the system manufacturer.

CYLS.	number of cylinders
HEADS	number of heads
PRECOMP	write precom
LANDZON	landing zone
E	
SECTORS	number of sectors

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

- Drive A type / Drive B type

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

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

- Video

The category detects 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.

EGA/VG A	Enhanced Graphics Adapter/Video Graphics Array. For EGA, VGA, SVGA, 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
MDNO	Monochrome adapter, includes high resolution monochrome adapters

- **Halt on**

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 not stop and you will be prompted
All errors	The system boot will stop 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 512 K for systems with 512 K memory installed on the motherboard, or 640 K for

systems with 640 K or more memory installed on the motherboard.

Extended Memory

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

Expanded Memory

Expanded Memory is memory defined by the Lotus/Intel/Microsoft (LIM) standard as EMS. Many standard DOS applications can not utilize memory above 64KB, the Expanded Memory Specification (EMS) swaps memory which is not utilized by DOS with a section, or frame, so these applications can access to all of the system memory. Memory can be swapped by EMS is usually 64KB within 1 MB or memory above 1 MB, depending on the chipset design.

Expanded memory device driver is required to use memory as Expanded Memory.

Other Memory

This refers to the memory located in the 640KB to 1024KB address space. This is the 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

4.6 BIOS FEATURES SETUP

ROM PCI/ISA BIOS
 BIOS FEATURES SETUP
 AWARD SOFTWARE, INC.

Virus Warning	: Disabled	Video BIOS Shadow	: Enabled
CPU Internal Cache	: Enabled	C8000 - CFFFF Shadow	: Disabled
External Cache	: Enabled	D0000 - D7FFF Shadow	: Disabled
Quick Power On Self Test	: Enabled	D8000 - DFFFF Shadow	: Disabled
Boot Sequence	: A, C		
Swap Floppy Drive	: Disabled		
Boot Up Floppy Seek	: Enabled		
Boot Up NumLock Status	: Off		
Boot Up System Speed	: High		
Security Option	: Setup		
PCI/VGA & ISA/MPEG INSTALL	: Disabled		
ESC : Quit ↑ ↓ → ← : Select Item F1 : Help PU/PD/+/- : Modify F5 : Old Values (Shift)F2 : Color F6 : Load BIOS Defaults F7 : Load Setup Defaults			

Figure 4.3: BIOS FEATURES SETUP

- 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 anti-virus program to locate the problem. The default value is Disabled.

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

- CPU Internal Cache / External Cache

These two categories speed up memory access. However, it depends on CPU / chipset design. The default value is Enabled.

Enabled	Enable cache.
Disabled	Disable cache.

- 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. The default value is Enabled.

Enabled	Enable quick POST.
Disabled	Normal POST.

- Boot Sequence

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

A,C	System will first search for floppy disk drive and then hard disk drive.
C,A	System will first search for hard disk drive and then floppy disk drive.

- Swap Floppy Drive

The default value is Disabled.

Enabled	Floppy A & B will be swapped under DOS.
Disabled	Floppy A & B will be normal definition.

- Boot Up Floppy Seek

During POST, BIOS will determine if the floppy disk drive installed is 40 or 80 tracks. 360 type is 40 tracks while 720,1.2 and 1.44 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 cannot tell from 720, 1.2 or 1.44 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 message if the driver installed is 360.

- Boot Up NumLock Status

The default value is Off.

On	Keypad is number keys.
Off	Keypad is arrow keys.

- Boot Up System Speed

The default value is High.

High	CPU input clock depends on the setting of JP7 (CPU input clock jumper).
Low	CPU input clock is fixed on 33 MHz.

- Security Option

The default value is Setup.

Setup	Asking password when enter CMOS Setup.
System	Asking password when enter CMOS Setup and boot system.

- PCI/VGA & ISA/MPEG Install

The default value is Disabled.

Enabled	Enable PCI/VGA & ISA/MPEG Install.
Disabled	Disable PCI/VGA & ISA/MPEG Install.

- C8000 - CFFFF Shadow / D0000 - DFFFF Shadow

These categories determine whether optional ROM will be copied to RAM by 16K byte. The default value are Disabled.

Enabled	Optional shadow is enabled.
Disabled	Optional shadow is disabled.

4.7 CHIPSET FEATURES SETUP

ROM PCI/ISA BIOS
 CHIPSET FEATURES SETUP
 AWARD SOFTWARE, INC.

EDO,60nsDRAM or 40MHz CLK	: Disabled	Onboard FDD Controller	: Enabled
AT-Bus Clock	: CLK/4	Onboard Serial Port1	: COM1/3F8
DRAM Read Timing	: Normal	Onboard Serial Port2	: COM2/2F8
DRAM Write Timing	: Normal	Onboard Parallel Mode	: 378H
SRAM Read Timing	: 3-2-2-2	Onboard Parallel Port	: SPP
ISA I/O Recovery	: Enabled	ECP Mode Use DMA	: 3
On-Chip Local Bus IDE	: Enabled		
The 2nd channel IDE	: Enabled		
IDE HDD Block Mode	: Disabled		
IDE Primary Master PIO	: Auto		
IDE Primary Slave PIO	: Auto		
IDE Secondary Master PIO	: Auto		
IDE Secondary Slave PIO	: Auto		
Internal Cache WB/WT	: WB		
		ESC : Quit ↑ ↓ → ← : Select Item F1 : Help PU/PD/+/- : Modify F5 : Old Values (Shift)F2 : Color F6 : Load BIOS Defaults F7 : Load Setup Defaults	

Figure 4.4: CHIPSET FEATURES SETUP

- EDO,60nsDRAM or 40MHz CLK

The default value is Disabled.

Enabled	EDO DRAM or 60ns DRAM or 40MHz CLK Present. i 0X-40, DX2-80, DX4-120 ^
Disabled	EDO DRAM or 60ns DRAM or 40MHz CLK Absent. i 0X-40, DX2-80, DX4-120 ^

- AT Bus Clock

The default value is CLK/4.

7.19MHz	Normal setting.
PCICLK/3	For 25 MHz system; DX-25,DX2-50, DX4-75 ^
PCICLK/4	For 33 MHz system; DX-33, DX2-66, DX4-100, 5x86-100/133 ^
PCICLK/5	For 40 MHz system; DX-40, DX2-80, DX4-120 ^
PCICLK/6	Low AT Bus Clock.
PCICLK/8	Lowest AT Bus Clock.

- DRAM Read Timing

The default value is Normal.

Fastest	DRAM Read is Fastest.
Fast	DRAM Read is Fast.
Normal	DRAM Read is Normal.
Slow	DRAM Read is slow.

- DRAM Write Timing

The default value is Normal.

Fastest	DRAM Write is Fastest.
Fast	DRAM Write is Fast.
Normal	DRAM Write is Normal.
Slow	DRAM Write is slow.

- SRAM Read Timing

The default value is 3-2-2-2.

2-1-1-1	SRAM read is 2-1-1-1.
3-1-1-1	SRAM read is 3-1-1-1.
3-2-2-2	SRAM read is 3-2-2-2.
4-2-2-2	SRAM read is 4-2-2-2.

- Internal Cache WB/WT

The default value is WB.

WB	Internal cache is WB.
WT	Internal cache is WT.

* This option is for Cyrix DX4-100, DX2-80 or DX2-66 only.

- ISA I/O Recovery

The default value is Enabled.

Enabled	Enable ISA I/O Recovery.
Disabled	Disable ISA I/O Recovery.

- On-Chip Local Bus IDE

The default value is Enabled.

Enabled	Enable On-Chip Local Bus IDE.
Disabled	Disable On-Chip Local Bus IDE.

- The 2nd channel IDE

The default value is Enabled.

Enabled	Enable IDE 2nd Channel.
Disabled	Disable IDE 2nd Channel.

- IDE HDD Block Mode

The default value is Disabled.

Enabled	Enable IDE HDD block mode.
Disabled	Disable IDE HDD block mode.

- IDE Primary/Secondary -- Master/Slave PIO

The default value is Auto.

Auto	BIOS will automatically detect IDE HDD Accessing mode.
Mode 0-4	Manually set the IDE Accessing mode.

- Onboard FDD Controller

The default value is Enabled.

Enabled	Enable Onboard FDD Controller.
Disabled	Disable Onboard FDD Controller.

- Onboard Serial Port1

The default value is COM1.

COM1/3F8	Enable onboard Serial port1 and address is 3F8H.
COM2/2F8	Enable onboard Serial port1 and address is 2F8H.
COM3/3E8	Enable onboard Serial port1 and address is 3E8H.
COM4/2E8	Enable onboard Serial port1 and address is 2E8H.
Disabled	Disable onboard Serial port1.

- Onboard Serial Port2

The default value is COM2.

COM1/3F8	Enable onboard Serial port2 and address is 3F8H.
COM2/2F8	Enable onboard Serial port2 and address is 2F8H.
COM3/3E8	Enable onboard Serial port2 and address is 3E8H.
COM4/2E8	Enable onboard Serial port2 and address is 2E8H.
Disabled	Disable onboard Serial port2.

- Onboard Parallel Port

The default value is 378H.

378H	Enable onboard LPT port and address is 378H.
278H	Enable onboard LPT port and address is 278H.
3BCH	Enable onboard LPT port and address is 3BCH.
Disabled	Disable onboard LPT port.

- Onboard Parallel Mode
The default value is SPP.

Disabled	Disable onboard LPT port.
SPP Mode	Using Parallel port as Standard Printer port.
EPP Mode	Using Parallel port as Enhanced Parallel port.
ECP Mode	Using Parallel port as Extended Capabilities port.
ECP/EPP Mode	Using Parallel port as Extended Capabilities port & Enhanced Parallel port.

- Onboard Parallel Mode
This option will show up when On board Parallel Port set to ECP Mode.
The default value is 3.

4.8 POWER MANAGEMENT SETUP

ROM PCI/ISA BIOS
POWER MANAGEMENT SETUP
AWARD SOFTWARE, INC.

Power Management	: Enable	
PM Control By APM	: Yes	
Video Off Method	: DPMS Support	
** PM Timers **		
HDD Power Down	: Disable	
Suspend mode	: Disable	
** PM Events **		
VGA	: ON	
HDD (1FXh)	: ON	
IRQ3 (COM 2)	: ON	
IRQ4 (COM 1)	: ON	
IRQ5 (LPT 2)	: OFF	
IRQ7 (LPT 1)	: OFF	
IRQ9 (IRQ2 Redir)	: OFF	
IRQ10 (Reserved)	: OFF	
IRQ11 (Reserved)	: OFF	
IRQ12 (PS/2 Mouse)	: OFF	
IRQ14 (Hard Disk)	: ON	
IRQ15 (Reserved)	: ON	
		ESC : Quit ↑ ↓ → ← : Select Item
		F1 : Help PU/PD/+- : Modify
		F5 : Old Values (Shift)F2 : Color
		F6 : Load BIOS Defaults
		F7 : Load Setup Defaults

Figure 4.5: POWER MANAGEMENT SETUP

- Power Management
The default value is Enable.

Enabled	Enable Green function.
Disabled	Disable Green function.

- PM Control By APM

The default value is Yes.

No	Disable software APM function.
Yes	Enable software APM function.

- Video Off Method

The default value is DPMS Support.

V/H SYNC + Blank	BIOS will turn off V/H-SYNC when gets into Green mode for Green monitor power saving.
Blank Screen	BIOS will only black monitor when gets into Green mode.
DPMS Support	If your VGA CARD can support DPMS (Display Power Management Signaling), you may select the "DPMS Support" to reduce the VGA monitor power consumption and if your VGA driver is installed, you have to select "DPMS Support" to Black your monitor when system get into Green mode in Win95 or Win 3.11.

- HDD Power Down

The default value is Disabled.

Disabled	Disable HDD Power Down mode function.
1-15 mins	Enable HDD Power Down mode between 1 to 15 mins.

- Suspend Mode

The default value is Disabled.

Disabled	Disable Suspend Mode.
10 sec - 1 Hour	Setup the timer to enter Suspend Mode.

- VGA, HDD, IRQ3,4,5,7,9,10,11,12,14,15

On	Monitor VGA , HDD, IRQ3,4,5,7,9,10,11,12,14,15 Active.
Off	Don't Monitor VGA, HDD, IRQ3,4,5,7,9,10,11,12,14,15 Active.

4.9 PCI CONFIGURATION SETUP

ROM PCI/ISA BIOS
 PCI CONFIGURATION SETUP
 AWARD SOFTWARE, INC.

PnP BIOS Auto-Config	: Disabled	ESC : Quit ↑ ↓ → ← : Select Item F1 : Help PU/PD/+/- : Modify F5 : Old Values (Shift)F2 : Color F6 : Load BIOS Defaults F7 : Load Setup Defaults
Slot 1 Using INT#	: AUTO	
Slot 2 Using INT#	: AUTO	
Slot 3 Using INT#	: AUTO	
1st Available IRQ	: 10	
2nd Available IRQ	: 11	
3rd Available IRQ	: 12	
4th Available IRQ	: 9	
PCI IRQ Activated By	: Edge	
PCI IDE 2nd Channel	: Enabled	
PCI IDE IRQ Map To	: PCI-AUTO	
Primary IDE INT#	: A	
Secondary IDE INT#	: B	
CPU to PCI Write Buffer	: Enabled	
PCI to DRAM Buffer	: Enabled	

Figure 4.6: PCI CONFIGURATION SETUP

- PnP BIOS Auto-Config

The default value is Disable.

Disabled	Disable PnP BIOS Auto-Config.
Enabled	Enable PnP BIOS Auto-Config.

- SLOT 1~3 Using INT#

The default value is AUTO.

AUTO	The BIOS auto detect the PCI device using INTA ~ D and auto set up a available IRQ to let device use.
A ~ D	For some not PCI specification compliant device, the user must set up IRQ manually.

- Available IRQ

The default value is shown on the above table.

These available IRQs are Mapped to be PCI INT# by BIOS for PCI device automatically. If some one IRQ is used by ISA device then the user must keep the IRQ out of the available table.

- PCI IRQ Activated By

The default value is Edge.

Edge	Normal Operation.
Level	For some PCI SCSI or Lan device using same PCI INT.

- PCI IDE 2nd Channel

The default value is Enable.

Enabled	Enable PCI IDE 2nd channel on board.
Disabled	Disable PCI IDE 2nd channel on board.

- PCI IDE IRQ Map To

The default value is PCI-AUTO.

ISA	Map PCI IDE IRQ to ISA slot.
PCI-SLOT1	Map PCI IDE IRQ to PCI slot1.
PCI-SLOT2	Map PCI IDE IRQ to PCI slot2.
PCI-SLOT3	Map PCI IDE IRQ to PCI slot3.
PCI-AUTO	Map PCI IDE IRQ to PCI slot automatically.

- Primary / Secondary IDE INT#

You will see this option if you set PCI IDE IRQ MAP TO PCI-slot1, PCI-slot2, PCI-slot3 or PCI-AUTO.

Set INT# for Primary / Secondary PCI IDE. The Default value is A / B.

A	Set INTA for Primary / Secondary PCI IDE.
B	Set INTB for Primary / Secondary PCI IDE.
C	Set INTC for Primary / Secondary PCI IDE.
D	Set INTD for Primary / Secondary PCI IDE.

- CPU to PCI Write Buffer

The default value is Enabled.

Enabled	Enable CPU to CPU writer buffer.
Disabled	Disable CPU to CPU writer buffer.

- PCI to DRAM Buffer

The default value is Enabled.

Enabled	Enable PCI to DRAM buffer.
Disabled	Disable PCI to DRAM buffer.

4.10LOAD BIOS DEFAULTS

ROM PCI/ISA BIOS
 LOAD BIOS DEFAULTS
 AWARD SOFTWARE, INC.

STANDARD CMOS SETUP	SUPERVISOR PASSWORD
BIOS FEATURES SETUP	USER PASSWORD
CHIPSET FEATURES SETUP	IDE HDD AUTO DETECTION
POWER MANAGEMENT	FORMAT
PCI / GREEN CONFIGURATION	UP
LOAD BIOS DEFAULTS	EXIT WITHOUT SAVING
LOAD SETUP DEFAULTS	
Load BIOS Defaults (Y/N)? N	
ESC : Quit	↑ ↓ → ← : Select Item
F10 : Save & Exit Setup	(Shift)F2 : Change Color
Load SETUP Defaults except Standard CMOS SETUP	

Figure 4.7: LOAD BIOS DEFAULTS

- Load BIOS Defaults

To load BIOS defaults value to CMOS SRAM, enter "Y". If not, enter "N".

4.11 LOAD SETUP DEFAULTS

ROM PCI/ISA BIOS
 LOAD SETUP DEFAULTS
 AWARD SOFTWARE, INC.

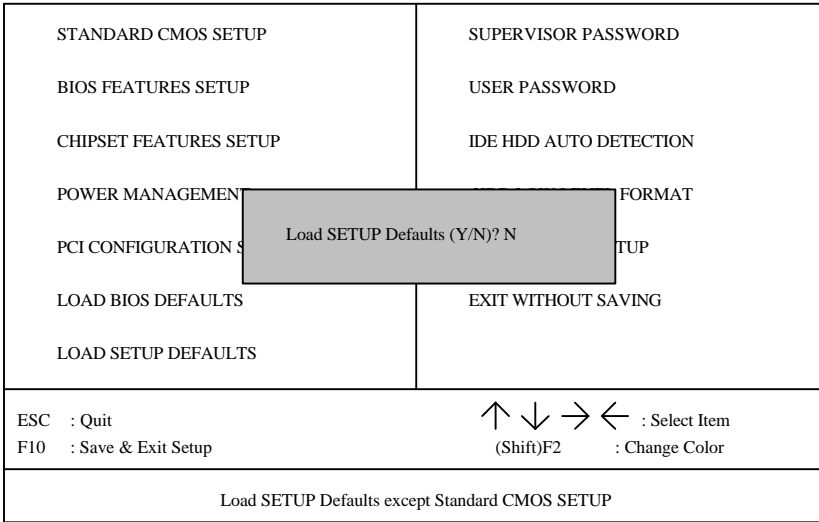


Figure 4.8: LOAD SETUP DEFAULTS

- Load Setup Defaults

To load Setup defaults value to CMOS SRAM, enter "Y". If not, enter "N".

4.12 SUPERVISOR PASSWORD

PASSWORD SETTING

When you select this function, the following message will appear at the center of the screen to assist you in creating a password.

ROM PCI/ISA BIOS
SUPERVISOR PASSWORD
AWARD SOFTWARE, INC.

STANDARD CMOS SETUP	SUPERVISOR PASSWOR
BIOS FEATURES SETUP	USER PASSWOR
CHIPSET FEATURES SETUP	IDE HDD AUTO DETECTION
POWER MANAGEMENT	LEVEL FORMAT
PCI CONFIGURATION S	UP
LOAD BIPS DEFAULTS	EXIT WITHOUT SAVING
LOAD SETUP DEFAULTS	
Enter Password:	
ESC : Quit	↑ ↓ → ← : Select Item
F10 : Save & Exit Setup	(Shift)F2 : Change Color
Change / Set / Disabled Password	

Figure 4.9: SUPERVISOR PASSWORD

Type the password, up to eight characters, and press <Enter>. The password typed now will clear and 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 to 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

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

4.13 USER PASSWORD

ROM PCI/ISA BIOS
 USER PASSWORD
 AWARD SOFTWARE, INC.

STANDARD CMOS SETUP	SUPERVISOR PASSWOR
BIOS FEATURES SETUP	USER PASSWOR
CHIPSET FEATURES SETUP	IDE HDD AUTO DETECTION
POWER MANAGEMEN	VEL FORMAT
PCI CONFIGURATION S	UP
LOAD BIPS DEFAULTS	EXIT WITHOUT SAVING
LOAD SETUP DEFAULTS	

Enter Password:

ESC : Quit	↑ ↓ → ← : Select Item (Shift)F2 : Change Color	
Change / Set / Disabled Password		

Figure 4.10: USER PASSWORD

4.14 IDE HDD AUTO DETECTION

ROM PCI/ISA BIOS
 IDE HDD AUTO DETECTION
 AWARD SOFTWARE, INC.

HARD DISKS	TYPE	SIZE	CYLS	HEADS	PRECOMP	LANDZ	SECTOR	MODE
Primary Master:								
Select Primary Master Option (N:Skip): N								
OPTIONS	SIZE	CYLS.	HEADS	PRECOMP	LANDZONE	SECTORS	MODE	
2(Y)	1081	524	64	0	2098	63	LBA	
1	1082	2099	16	65535	2098	63	NORMAL	
3	1083	1049	32	65535	2098	63	LARGE	
ESC : Skip								

Figure 4.11: IDE HDD AUTO DETECTION

Type "Y" will accept the H.D.D. parameter reported by BIOS. Type "N" will keep the old H.D.D. parameter setup. If the hard disk cylinder NO. is over 1024, then the user can select LBA mode or LARGER mode for DOS partition LARGER than 528 MB.

4.15 HDD LOW LEVEL FORMAT

This selection support IDE HDD low level format function.

4.16 SAVE & EXIT SETUP

ROM PCI/ISA BIOS
 SAVE & EXIT SETUP
 AWARD SOFTWARE, INC.

STANDARD CMOS SETUP	SUPERVISOR PASSWORD
BIOS FEATURES SETUP	USER PASSWORD
CHIPSET FEATURES SETUP	IDE HDD AUTO DETECTION
POWER MANAGEMENT	FORMAT
PCI CONFIGURATION	UP
LOAD BIOS DEFAULTS	EXIT WITHOUT SAVING
LOAD SETUP DEFAULTS	

SAVE to CMOS and EXIT (Y/N)? N

ESC : Quit F10 : Save & Exit Setup	↑ ↓ → ← : Select Item (Shift)F2 : Change Color
---------------------------------------	---------------------------------------------------

Save Data CMOS & Exit SETUP

Figure 4.13: SAVE & EXIT SETUP

Type "Y" will quit the Setup Utility and save the user setup value to RTC CMOS SRAM.
 Type "N" will return to Setup Utility.

4.17 EXIT WITHOUT SAVING

ROM PCI/ISA BIOS
 EXIT WITHOUT SAVING
 AWARD SOFTWARE, INC.

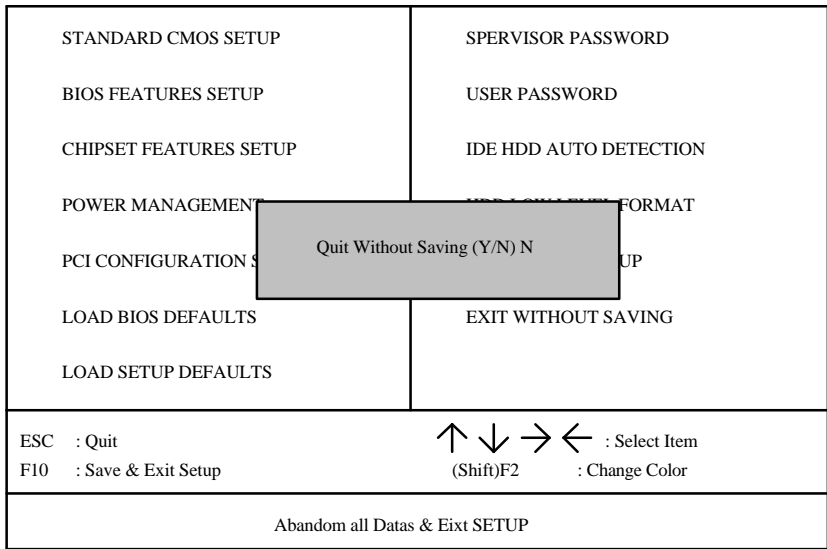


Figure 4.14: EXIT WITHOUT SAVING

Type "Y" will quit the Setup Utility without saving to RTC CMOS SRAM. Type "N" will return to Setup Utility.

4.18 KEYBOARD SETTING FUNCTION

After booting the O.S., there are some special functions used by keyboard as follows:

"CTRL_ALT_DEL"	Pressing these keys simultaneously will cause system a WARM START (Soft Reset).
"CTRL_ALT_[+]"	If J4 open, pressing these keys simultaneously will change the system speed to high speed (TURBO, all cache memory enabled).
"CTRL_ALT_-]"	If J4 open, pressing these keys simultaneously will change the system speed to low speed (Normal, disable cache memory).

5 AT TECHNICAL INFORMATION

5.1 BUS CONNECTOR PIN OUT

5.1.1 ISA BUS SLOT PIN OUT

GND	B01	A01	-I/O CH CHK				
RESET	B02	A02	SD07				
+5V	B03	A03	SD06				
IRQ9	B04	A04	SD05				
-5V	B05	A05	SD04				
DRQ2	B06	A06	SD03				
-12V	B07	A07	SD02				
0WS	B08	A08	SD01				
+12V	B09	A09	SD00				
GND	B10	A10	-I/O CH RDY				
-SMEMW	B11	A11	AEN				
-SMEMR	B12	A12	SA19				
-IOW	B13	A13	SA18				
-IOR	B14	A14	SA17				
-DACK3	B15	A15	SA16				
-DRQ3	B16	A16	SA15				
-DACK1	B17	A17	SA14				
-DRQ1	B18	A18	SA13				
-REFRESH	B19	A19	SA12				
BCLK	B20	A20	SA11				
IRQ7	B21	A21	SA10				
IRQ6	B22	A22	SA09				
IRQ5	B23	A23	SA08				
IRQ4	B24	A24	SA07				
IRQ3	B25	A25	SA06				
-DACK2	B26	A26	SA05				
T/C	B27	A27	SA04				
BALE	B28	A28	SA03				
+5V	B29	A29	SA02				
OSC	B30	A30	SA01				
GND	B31	A31	SA00				
				-MEMCS16	D01	C01	SBHE
				-I/OCS16	D02	C02	LA23
				IRQ10	D03	C03	LA22
				IRQ11	D04	C04	LA21
				IRQ12	D05	C05	LA20
				IRQ15	D06	C06	LA19
				IRQ14	D07	C07	LA18
				-DACK0	D08	C08	LA17
				DRQ0	D09	C09	-MEMR
				-DACK5	D10	C10	-MEMW
				DRQ5	D11	C11	SD08
				-DACK6	D12	C12	SD09
				DRQ6	D13	C13	SD10
				-DACK7	D14	C14	SD11
				DRQ7	D15	C15	SD12
				+5V	D16	C16	SD13
				-MASTER	D17	C17	SD14
				GND	D18	C18	SD15

5.1.2 PCI BUS SLOT PIN OUT

-12V	B01	A01	NC
NC	B02	A02	+12V
GND	B03	A03	NC
NC	B04	A04	NC
VCC	B05	A05	VCC
VCC	B06	A06	INTA#
INTB#	B07	A07	INTC#
INTD#	B08	A08	VCC
PST#1	B09	A09	NC
NC	B10	A10	VCC
PST#2	B11	A11	NC
GND	B12	A12	GND
GND	B13	A13	GND
NC	B14	A14	NC
GND	B15	A15	RST#
CLK	B16	A16	VCC
GND	B17	A17	GNT#
REQ#	B18	A18	GND
VCC	B19	A19	NC
AD_31	B20	A20	AD_30
AD_29	B21	A21	NC
GND	B22	A22	AD_28
AD_27	B23	A23	AD_26
AD_25	B24	A24	GND
NC	B25	A25	AD_24
CBE#3	B26	A26	IDSEL
AD_23	B27	A27	NC
GND	B28	A28	AD_22
AD_21	B29	A29	AD_20
AD_19	B30	A30	GND
NC	B31	A31	AD_18
AD_17	B32	A32	AD_16
CEB#2	B33	A33	NC
GND	B34	A34	FRAME#
IRDY#	B35	A35	GND
NC	B36	A36	TRDY#
DEVSEL#	B37	A37	GND
GND	B38	A38	STOP#
LOCK#	B39	A39	NC
PERR#	B40	A40	SDONE
NC	B41	A41	SBO#
SERR#	B42	A42	GND
NC	B43	A43	PAR
CBE#1	B44	A44	AD_15
AD_14	B45	A45	NC
GND	B46	A46	AD_13
AD_12	B47	A47	AD_11
AD_10	B48	A48	GND
GND	B49	A49	AD_09
AD_08	B52	A52	CBE#0
AD_07	B53	A53	NC
NC	B54	A54	AD_06
AD_05	B55	A55	AD_04
AD_03	B56	A56	GND
GND	B57	A57	AD_02
AD_01	B58	A58	AD_00
VCC	B59	A59	VCC
NC	B60	A60	NC
VCC	B61	A61	VCC
VCC	B62	A62	VCC

5.2 I/O & MEMORY MAP

MEMORY MAP:	[0000000-009FFFF]	System memory used by DOS and application program.
	[00A0000-00BFFFF]	Display buffer memory for VGA/EGA/CGA/MONOCHROME adapter.
	[00C0000-00DFFFF]	Reserved for I/O device BIOS ROM or RAM buffer.
	[00E0000-00EFFFF]	Reserved for PCI device ROM.
	[00F0000-00FFFFFF]	System BIOS ROM.
	[0100000-BFFFFFF]	System extension memory.
I/O MAP:	[000-01F]	DMA controller.(Master) INTERRUPT controller.(Master) CHIPSET control registers I/O ports.
	[040-05F]	TIMER control registers.
	[060-06F]	KEYBOARD interface controller.(8042)
	[070-07F]	RTC ports & CMOS I/O ports.
	[080-09F]	DMA register.
	[0A0-0BF]	INTERRUPT controller.(Slave)
	[0C0-0DF]	DMA controller.(Slave)
	[0F0-0FF]	MATH COPROCESSOR
	[1F0-1F8]	HARD DISK controller.
	[278-27F]	PARALLEL port-2.
	[2B0-2DF]	GRAPHICS adapter controller.
	[2F8-2FF]	SERIAL port-2.
	[360-36F]	NETWORK ports.
	[378-37F]	PARALLEL port-1
	[3B0-3BF]	MONOCHROME & PRINTER adapter.
	[3C0-3CF]	EGA adapter.
	[3D0-3DF]	CGA adapter.
	[3F0-3F7]	FLOPPY DISK controller.
	[3F8-3FF]	SERIAL port-1.

5.3 TIMER & DMA CHANNELS MAP

TIMER MAP:	TIMER Channel-0 System timer interrupt
	TIMER Channel-1 DRAM REFRESH request
	TIMER Channel-2 SPEAKER tone generator
DMA CHANNELS:	DMA Channel-0 Available
	DMA Channel-1 IBM SDLC
	DMA Channel-2 FLOPPY DISK adapter
	DMA Channel-3 Available
	DMA Channel-4 Cascade for DMA controller 1
	DMA Channel-5 Available
	DMA Channel-6 Available
	DMA Channel-7 Available

5.4 INTERRUPT MAP

NMI:	Parity check error
IRQ (H/W):	System TIMER interrupt from TIMER-0
	KEYBOARD output buffer full
	Cascade for IRQ 8-15
	SERIAL port 2
	SERIAL port 1
	PARALLEL port 2
	FLOPPY DISK adapter
	PARALLEL port 1
	RTC clock
	Available
	Available
	Available
	Available
	MATH coprocessor
	HARD DISK adapter
	Available

5.5 RTC & CMOS RAM MAP

RTC & CMOS:	Seconds
	Second alarm
	Minutes
	Minutes alarm
	Hours
	Hours alarm
	Day of week
	Day of month
	Month
	Year
0A	Status register A
0B	Status register B
0C	Status register C
0D	Status register D
0E	Diagnostic status byte
0F	Shutdown byte
	FLOPPY DISK drive type byte
	Reserve
	HARD DISK type byte
	Reserve
	Equipment byte
	Base memory low byte
	Base memory high byte
	Extension memory low byte
	Extension memory high byte
19-2d	
2E-2F	
	Reserved for extension memory low byte
	Reserved for extension memory high byte
	DATE CENTURY byte
	INFORMATION FLAG
34-3F	Reserve
40-7f	Reserved for CHIPSET SETTING DATA

APPENDIX A: POST MESSAGE

When the BIOS encounters an error that requires the user to correct something, either a beep code will sound or a message will be displayed in a box in the middle of the screen and the message PRESS F1 TO CONTINUE, CTRL-ALT-ESC OR DEL TO ENTER SETUP will be shown in the information box at the bottom.

- 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 MESSAGE

Once or more of the following messages may be displayed if the BIOS detects an error during the POST. This list includes message 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 been corrupted. This error may have been caused by a weak battery. Check the battery and replace it if necessary.

- ☒ DISK BOOT FAILURE, INSERT SYSTEM DISK AND PRESS ENTER

No boot device was found. 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 re-configure 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.

- ☒ 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 in 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 is no floppy drive installed, be sure the Diskette Drive selection in Setup is set to NONE.

⊗ 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 configuring the system without a keyboard, set the error halt condition in Setup to HALT ON ALL, BUT KEYBOARD. This will cause the BIOS to ignore the missing keyboard and continue the boot.

⊗ Memory Address Error 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 SIZE HAS CHANGED SINCE LAST BOOT

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

⊗ Memory Verify Error at ...

Indicate an error verifying a value already written to memory. Use the location along with your system 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 with 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 with 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 will the NMI enabled.

⊗ 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.

APPENDIX B: POST CODES

☞ ISA POST codes are typically output to port address 80h.

POST	Name	Description
C0	Turn Off Chipset Cache	OEM Specific-Cache control.
1	Processor Test 1	Processor Status (1 FLAGS) Verification. Test the following processor status flags carry, zero, sign, overflow, The BIOS will set each of these flags, verify they are set, then turn each flag off and verify it is off.
2	Processor Test 2	Read/Write/Verify all CPU registers except SS, SP, and BP with data pattern FF and 00.
3	Initialize Chips	Disable NMI, PIE, AIE, UEI, SQWV. Disable video, parity checking, DMA. Reset math coprocessor. Clear all page registers, CMOS shutdown byte. Initialize timer 0, 1, and 2, including set EISA timer to a known state. Initialize DMA controllers 0 and 1. Initialize interrupt controllers 0 and 1. Initialize EISA extended registers.
4	Test Memory Refresh Toggle	RAM must be periodically refreshed in order to keep the memory from decaying. This function assures that the memory refresh function is working properly.
5	Blank video, Initialize keyboard	Keyboard controller initialization.
6	Reserved	
7	Test CMOS Interface and Battery Status	Verifies CMOS is working correctly, detects bad battery.
BE	Chipset Default Initialization	Program chipset registers with power on BIOS defaults.
C1	Memory presence test	OEM Specific-Test to size on-board memory.
C5	Early Shadow	OEM Specific-Early Shadow enable for fast boot.
C6	Cache presence test	External cache size detection.
8	Setup low memory	Early chip set initialization. Memory presence test. OEM chip set routines. Clear low 64 K of memory. Test first 64 K memory.
9	Early Cache Initialization	Cyrix CPU initialization. Cache initialization.
A	Setup Interrupt Vector Table	Initialize first 120 interrupt vectors with SPURIOUS_INT-HDLR and initialize INT 00h-1Fh according to INT_TBL.
B	Test CMOS RAM Checksum	Test CMOS RAM Checksum, if bad, or insert key pressed, load defaults.
C	Initialize keyboard	Detect type of keyboard controller (optional). Set NUM_LOCK status.
D	Initialize Video Interface	Detect CPU clock. Read CMOS location 14h to find out type of video in use. Detect and Initialize Video Adapter.
E	Test Video Memory	Test video memory, write sign-on message to screen. Setup shadow RAM - Enable shadow according to Setup.
F	Test DMA Controller 0	BIOS checksum test. Keyboard detect and initialization.
10	Test DMA Controller 1	
11	Test DMA Page	Test DMA Page Registers.

	registers	
12-13	Reserved	
14	Test Timer Counter 2	Test 8254 Timer 0 Counter 2.
15	Test 8259-1 Mask Bits	Verify 8259 Channel 1 masked interrupts by alternative turning off and on the interrupt lines.
16	Test 8259-2 Mask Bits	Verify 8259 Channel 2 masked interrupts by alternative turning off and on the interrupt lines.
17	Test Stuck 8259's Interrupt Bits	Turn off interrupts then verify no interrupt mask register is on.
18	Test 8259 Interrupt Functionality	Force an interrupt and verify the interrupt occurred.
19	Test Stuck NMI Bits (Parity/IO Check)	Verify NMI can be cleared.
1A		Display CPU clock.
1B-1E	Reserved	
20	Enable Slot 0	Initialize slot 0 (System Board).
21-2F	Enable Slots 1-15	Initialize slot 1 through 15.
30	Size Base and Extended Memory	Size base memory from 256 K to 640 K extended memory above 1 MB.
31	Test Base and Extended Memory	Test base memory from 256 K to 640 K and extended memory above 1 MB using various patterns. This will be skipped in EISA mode and can be "skipped" with ESC key in ISA mode.
33-3B	Reserved	
3C	Setup Enabled	
3D	Initialize & Install Mouse	Detect if mouse is present, initialize mouse, install interrupt vectors.
3E	Setup Cache Controller	Initialize cache controller.
3F	Reserved	
BF	Chipset Initialization	Program chipset registers with Setup values.
40		Display virus protect disable or enable.
41	Initialize Floppy Drive & Controller	Initialize floppy disk drive controller and any drives.
42	Initialize Hard Drive & Controller	Initialize hard drive controller and any drives.
43	Detect & Initialize Serial/Parallel Ports	Initialize any serial and parallel ports (also game port).
44	Reserved	
45	Detect & Initialize Math Coprocessor	Initialize math coprocessor.
46	Reserved	
47	Reserved	
48-4D	Reserved	
4E	Manufacturing POST Loop or Display Messages	Reboot if Manufacturing POST Loop pin is set. Otherwise display any messages (i.e., any non-fatal errors that were detected during POST) and enter Setup.
4F	Security Check	Ask password security (optional).
50	Write CMOS	Write all CMOS values back to RAM and clear screen.
51	Pre-boot Enable	Enable parity checker. Enable NMI, Enable cache before boot.
52	Initialize Option ROMs	Initialize any option ROMs present from C8000h to EFFFFh. When FSCAN option is enabled, will initialize from C8000h to F7FFFh.
53	Initialize Time Value	Initialize time value in 40h: BIOS area.
60	Setup Virus Protect	Setup virus protect according to Setup

Appendix B: Post Codes

61	Set Boot Speed	Set system speed for boot
62	Setup NumLock	Setup NumLock status according to Setup
63	Boot Attempt	Set low stack. Boot via INT 19h.
B0	Spurious	If interrupt occurs in protected mode.
B1	Unclaimed NMI	If unmasked NMI occurs, display Press F1 to disable NMI, F2 reboot.
E1-EF	Setup Pages	E1 - Page 1, E2 - Page 2, etc.
FF	Boot	

APPENDIX C: BIOS DEFAULT DRIVE TABLE

Type	Size (MB)	Cylinders	Heads	Write/ Precomp	Land Zone	Sectors
1	10	306	4	128	305	17
2	21	615	4	300	615	17
3	32	615	6	300	615	17
4	65	940	8	512	940	17
5	49	940	6	512	940	17
6	21	615	4	65535	615	17
7	32	462	8	256	511	17
8	31	733	5	65535	733	17
9	117	900	15	65535	901	17
10	21	820	3	65535	820	17
11	37	855	5	65535	855	17
12	52	855	7	65535	855	17
13	21	306	8	128	319	17
14	44	733	7	65535	733	17
16	21	612	4	0	663	17
17	42	977	5	300	977	17
18	59	977	7	65535	977	17
19	62	1024	7	512	1023	17
20	31	733	5	300	732	17
21	44	733	7	300	732	17
22	31	733	5	300	732	17
23	10	306	4	0	336	17
24	42	977	5	65535	976	17
25	80	1024	9	65535	1023	17
26	74	1224	7	65535	1223	17
27	117	1224	11	65535	1223	17
28	159	1224	15	65535	1223	17
29	71	1024	8	65535	1023	17
30	98	1024	11	65535	1023	17
31	87	918	11	65535	1023	17
32	72	925	9	65535	926	17
33	89	1024	10	65535	1023	17
34	106	1024	12	65535	1023	17
35	115	1024	13	65535	1023	17
36	124	1024	14	65535	1023	17
37	17	1024	2	65535	1023	17
38	142	1024	16	65535	1023	17
39	119	918	15	65535	1023	17
40	42	820	6	65535	820	17
41	44	1024	5	65535	1023	17
42	68	1024	5	65535	1023	17
43	42	809	6	65535	852	17
44	64	809	6	65535	852	26
45	104	776	8	65535	775	33
User						

APPENDIX D: PROBLEM SHEET

1. Customer Data

Name
Address
Tel. No.
Fax. No.
Purchase Date

2. Mainboard Data

Model NO. GA-
Serial No. Rev. No.

3. System Configuration

CPU Type:
CPU Brand:
CPU Speed:
DRAM Type: 1 2 4 8 16 32 MB
DRAM Speed: 80 70 60 ns
DRAM Total Size: MB
DRAM Brand:
SRAM Size: 64KB 128 KB 256 KB 512 KB 1 MB
SRAM Part No. TAG: DATA:
Video Card:
Video Chip or Brand:
Floppy Drive A Capacity & Brand:
Floppy Drive B Capacity & Brand:
Storage Controller Type MFM RLL IDE ESDI SCSI
Hard Drive C Brand & Type:
Hard Drive D Brand & Type:
LAN Controller Type:
LAN Card Brand & Model:
Serial / Parallel Chip Brand & Model:
Mouse Brand & Model:
O.S. DOS OS/2 NETWARE UNIX / XENIX Ver.:

4. AUTOEXEC.BAT & CONFIG.SYS File:

5. Problem Description: