NAR-7061
Communication Appliance

User's Manual

Revision: 010

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Chapter 1 Introduction

1.1 About This Manual

This manual describes all required information for setting up and using the NAR-7061.

NAR-7061 provides the essential components for delivering optimal performance and functionality in the high-end communications appliance market segment. This manual should familiarize you with NAR-7061 operations and functions. NAR-7061 has six on-board Ethernet to serve communication appliances, such as Firewall, which needs six LAN ports to connect external network (internet), demilitarized zone and internal network.

Feature of NAR-7061 includes:

- The most advanced Communication Appliance built on Intel® , latest Netburst™ micro architecture and Hyper-Threading technology
- High computing power of dual Intel® Xeon™ processors
- 64bit Gigabit Ethernet provides high performance networking capacity
- Intel® E7500 chipset with 400MHz PSB
- User-friendly LCD control panel
- Comprehensive thermal solution for 1U platform
- Full-length PCI-X slot support
- 512MB PC1600 DDR RAM, upgradeable to 4GB
- Two IDE hard disk drives

1.2 Manual Organization

The manual describes how to configure your NAR-7061 system to meet various operating requirements. It is divided into three chapters, with each chapter addressing a basic concept and operation of this whole system.

Chapter 1: Introduction. This section briefly talks about how this document is organized. It includes some guidelines for users who do not want to read through everything, but still helps you find what you need.

Chapter 2: Hardware Configuration Setting and Installation. This chapter shows how the hardware is put together, including detailed information. It shows the definitions and locations of Jumpers and Connectors that you can easily configure your system. Descriptions on how to properly mount the CPU and main memory are also included to help you get a safe installation. Reading this chapter will teach you how to set up NAR-7061.

Chapter 3: Operation Information. This section gives you illustrations and more information on the system architecture and how its performance can be maximized.

Any updates to this manual, technical clarification and answers to frequently asked questions would be posted on the web site: ***http://isc.portwell.com.tw***

1.3 Technical Support Information

Users may find helpful tips or related information on Portwell's web site: ***http://www.portwell.com.tw***. A direct contact to Portwell's technical person is also available. For further support, users may also contact Portwell's headquarter in Taipei or your local distributors.

Taipei Office Phone Number: +886-2-27992020

Chapter 2 Getting Started

This section describes how the hardware installation and system settings should be done.

2.1 Included Hardware

The following hardware is included in your kit:

- PPAP-3720L Communication Appliance System Board
- One serial port Null MODEM cable
- One LCD Modules

2.2 Before You Begin

To prevent damage to any system board, it is important to handle it with care. The following measures are generally sufficient to protect your equipment from static electricity discharge:

When handling the board, use a grounded wrist strap designed for static discharge elimination and touch a grounded metal object before removing the board from the antistatic bag. Handle the board by its edges only; do not touch its components, peripheral chips, memory modules or gold contacts.

When handling processor chips or memory modules, avoid touching their pins or gold edge fingers. Put the value communications appliance system board and peripherals back into the antistatic bag when they are not in use or not installed in the chassis.

Some circuitry on the system board can continue operating even though the power is switched off. Under no circumstances should the Lithium coin cell used to power the real-time clock be allowed to be shorted. The coin cell can heat under these conditions and present a burn hazard.

WARNING!

1. **"CAUTION: DANGER OF EXPLOSION IF BATTERY IS INCORRECTLY REPLACED. REPLACE ONLY WITH SAME OR EQUIVALENT TYPE RECOMMENDED BY THE MANUFACTURER. DISCARD USED BATTERIES ACCORDING TO THE MANUFACTURER'S INSTRUCTIONS"**

2. **This guide is for technically qualified personnel who have experience installing and configuring system boards Disconnect the system board power supply from its power source before you connect/disconnect cables or install/remove any system board components. Failure to do this can result in personnel injury or equipment damage.**
3. **Avoid short-circuiting the lithium battery; this can cause it to superheat and cause burns if touched.**
4. **Do not operate the processor without a thermal solution. Damage to the processor can occur in seconds.**
5. **Do not block air vents. Minimum 1/2-inch clearance required.**

6. **Please switch off the power, before you install/remove any system components. It can avoid occurring any damages.**

2.3 The Chassis

The system is integrated in a customized 2U chassis (***Fig. 2-1, Fig. 2-2***).

On the front panel you will find 4-push-button LCD module and six Ethernet a COM port.

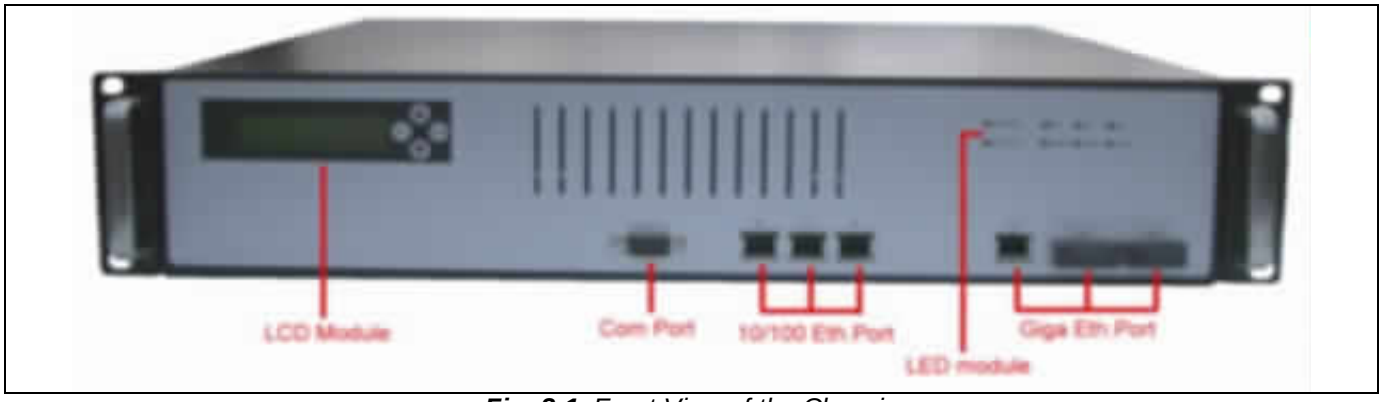


Fig. 2-1 *Front View of the Chassis*

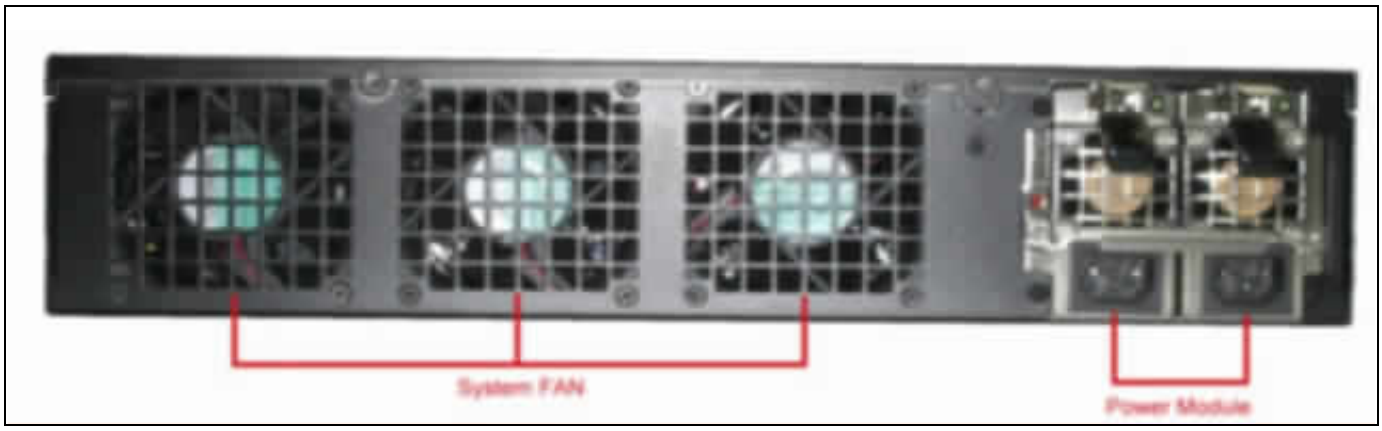


Fig. 2-2 *Rear View of the Chassis*

2.4 Opening the Chassis

1. Screws out from cover (***Fig. 2-3***), slide the cover backwards and pull the rear edge upwards. (***Fig. 2-4***)

Fig. 2-3 *Screws out from cover*

Fig. 2-4 *Slide the cover backwards and pull the rear edge upwards*

2. The top cover (***Fig. 2-5***) can be removed from the base stand (***Fig. 2-6***)

Fig. 2-5 *The top cover*

Fig. 2-6 *The base stand*

2.5 Installing or Removing a SODIMM

Follow these steps to upgrade RAM module:

1. Install the system memory by pulling the socket's arm and pressing it into the slot gently. (***Fig. 2-7, 2-8***) (Slot 1 and 3 or slot 2 and 4 must be populated simultaneously)

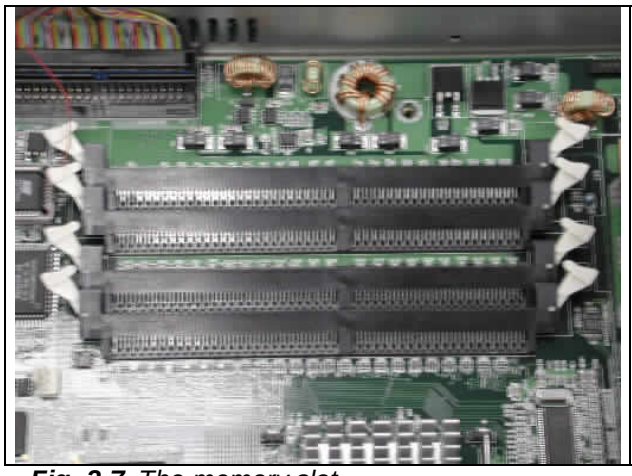


Fig. 2-7 *The memory slot*

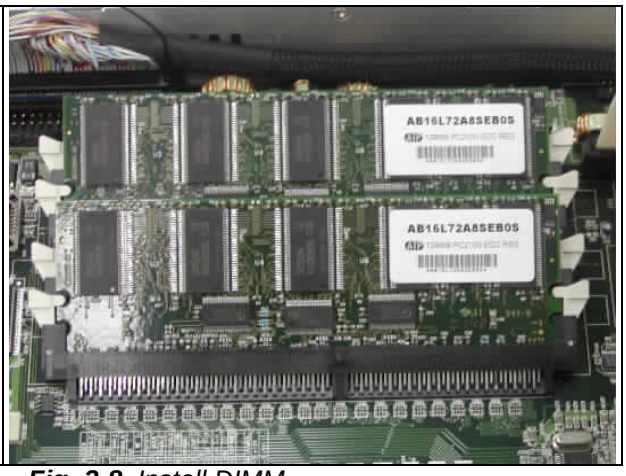


Fig. 2-8 *Install DIMM*

2. By pulling the arms, the DIMM can eject itself (***Fig. 2-9***)

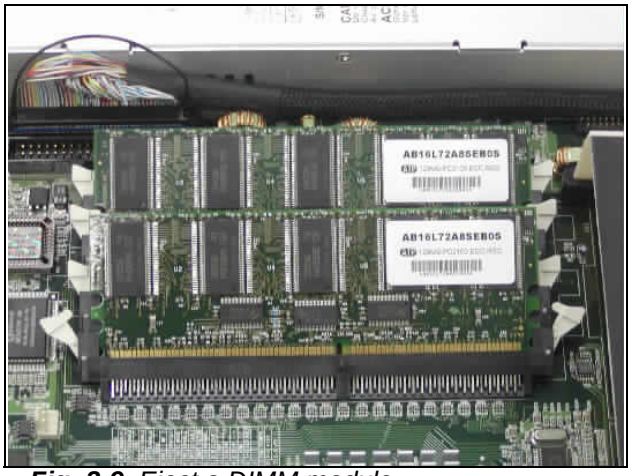


Fig. 2-9 *Eject a DIMM module*

2.6 Remove and Install CPU

1. Loosen and then take off the screws on the heat sink and cpu space. (***Fig. 2-10***).
2. Remove the heat sink (***Fig. 2-11***).

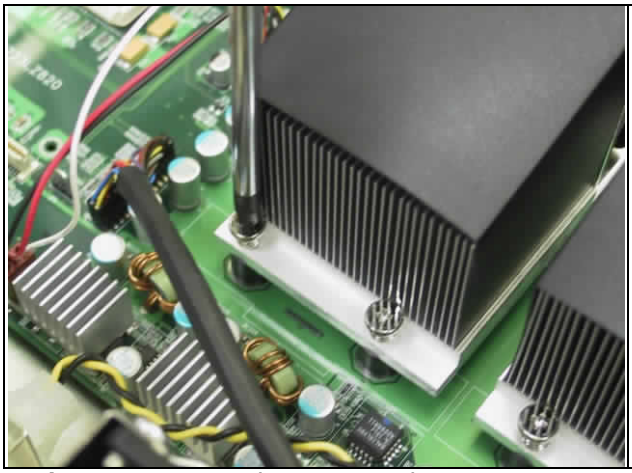


Fig. 2-10 *Loosen the screw and cpu space*

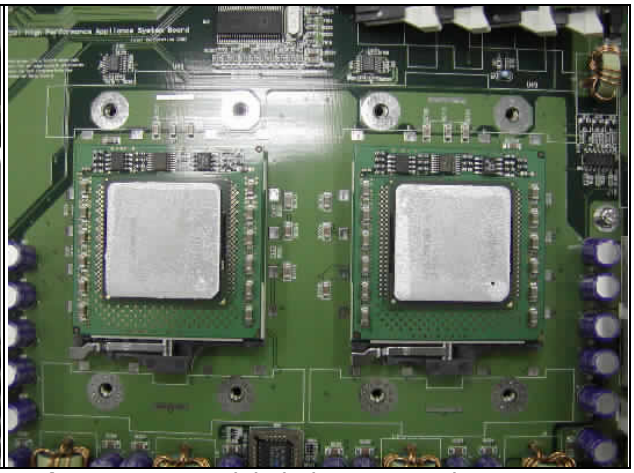


Fig. 2-11 *Heat sink being removed*

3. Loosen the CPU socket (***Fig 2-12***)
4. Take CPU off the board (***Fig 2-13***)

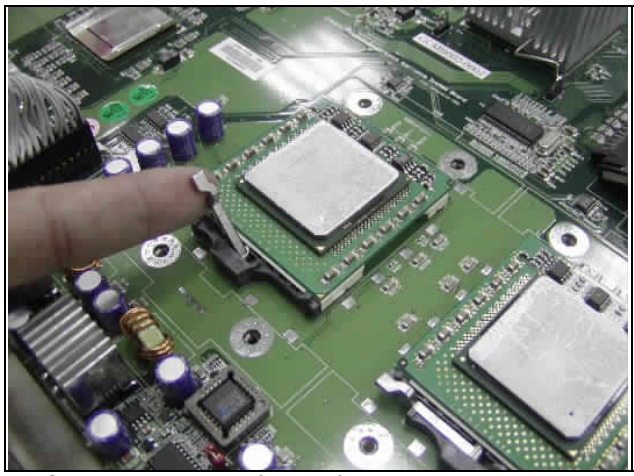


Fig. 2-12 *Loosen the socket*

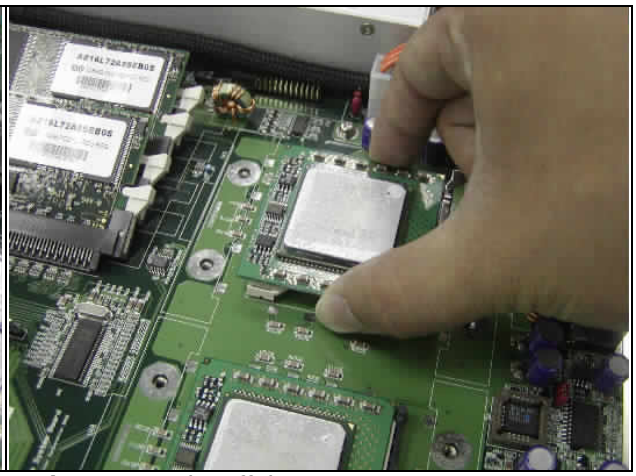


Fig. 2-13 *Take off the CPU*

5. Install CPU in opposite order as above

2.7 Remove and Install Battery

6. Press the metal clip back to eject the button battery (***Fig. 2-16***).
7. Replace it with a new one by pressing the battery with fingertip to restore the battery (***Fig. 2-17***).

Fig. 2-16 *Eject the battery*

Fig. 2-17 *Restore the battery*

2.8 Remove and Install HDD

The system has an internal drive bay for One 2.5" hard disk drive. If the HDD is not pre-installed, you can install it by yourself. Follow the steps below to install the HDD:

Before a HDD can be installed onto NAR-7061.

1. Remove HDD bracket (***Fig. 2-18***) install HDD into the HDD bracket.

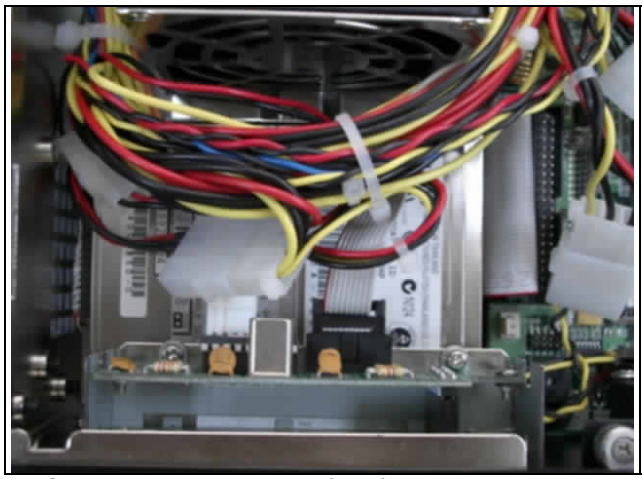


Fig. 2-18 *Remove HDD bracket*

Fig. 2-19 *A 2.5" HDD and the HDD bracket*

2. Fasten the both screws to lock HDD and bracket together (***Fig. 2-20***).

Fig. 2-20 Fix HDD to the bracket (in both sides)

Fig. 2-21 Connect power and IDE cable to HDD

3. Connect the IDE cable and power connector to HDD (***Fig. 2-21***).
4. Fasten both screws back to lock HDD onto chassis (***Fig. 2-22***).

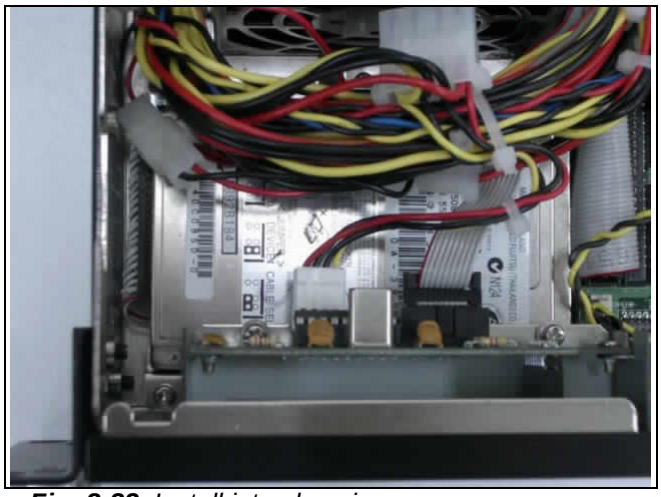


Fig. 2-22 Install into chassis

2.9 Remove and Install PCI-X card

One PCI-X slot is available to NAR-7061. Follow the steps below for installation:

1. The PCI-X slot is located on the left of the board. (***Fig. 2-23***)
2. The back of the PCI-X card should be against the back of NAR-7061. (***Fig. 2-24, 2-25***)

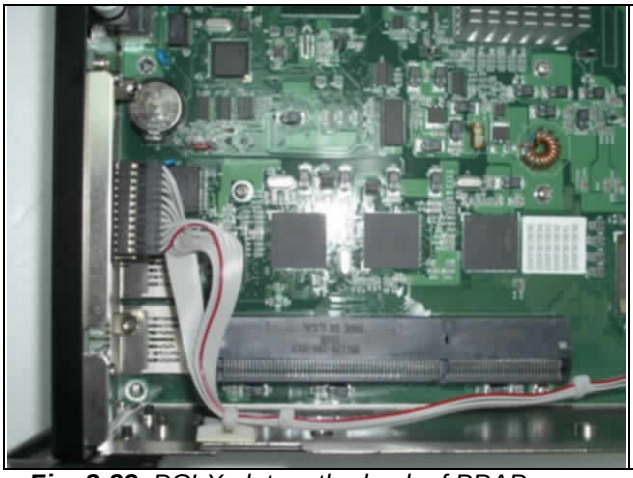


Fig. 2-23 *PCI-X slot on the back of PPAP-3720*

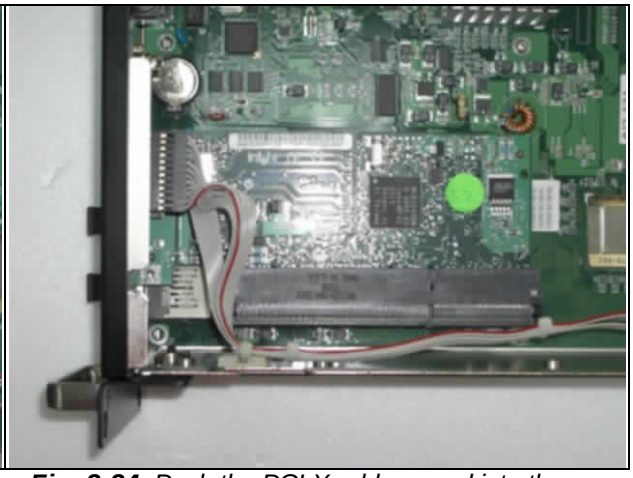


Fig. 2-24 *Push the PCI-X add-on card into the slot*

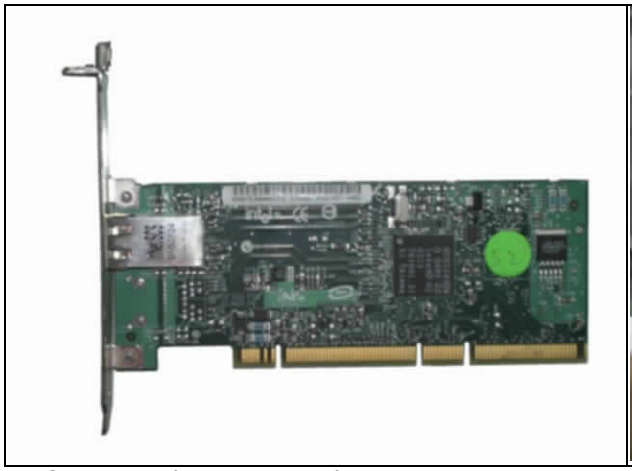


Fig. 2-25 *The PCI-X card*

Fig. 2-26 *The PCI-X card's bracket tip is placed outside of the chassis corner and Lock the screw*

3. The metal tip of the PCI-X card's bracket should be placed outside of the chassis corner. (***Fig. 2-26***)
4. 安裝完成後的面板 (***Fig. 2-27***)

Fig. 2-27 *安裝完成後的面板*

2.10 Remove and Install LED board & cable

跟著下列步驟,即可完成操作

1. LED board 位在 LCD module 下方(Fig. 2-28),將螺絲卸掉並將 LED cable 拔掉即可.
2. 從主機板上將 LED cable 拔掉即可將 cable 線拔起.(Fig. 2-29)

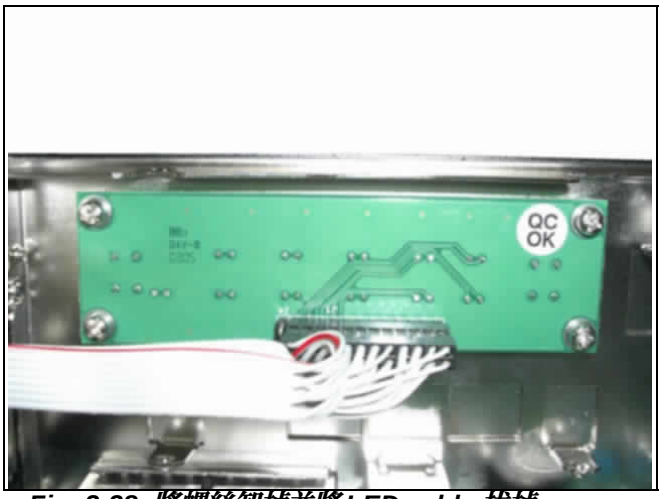


Fig. 2-28 將螺絲卸掉並將 LED cable 拔掉

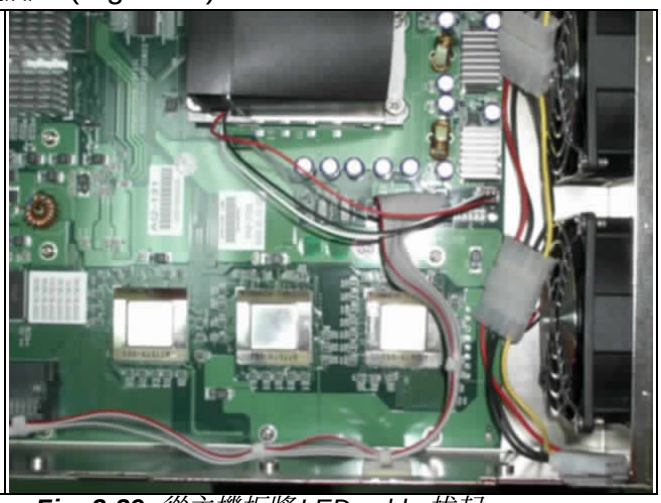


Fig. 2-29 *從主機板將 LED cable 拔起*

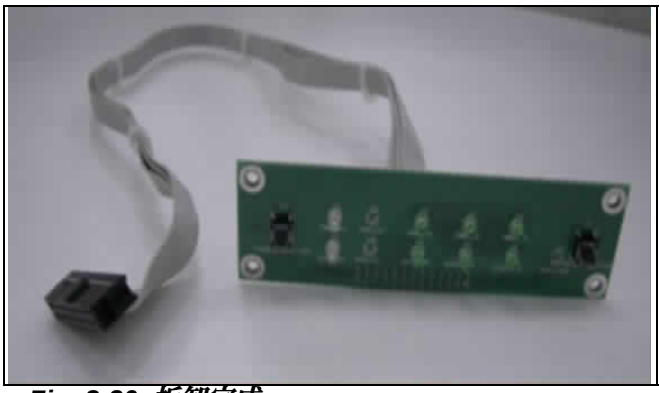


Fig. 2-30 拆卸完成

3. 重覆相反步驟即可將 LED board & cable 安裝回去.

2.11 Remove and Install System FAN

按照下列步驟,即可將系統風扇拆卸

1. 將進風口模組固定螺絲旋起再將電源線拔掉,即可取下進風口模組.(Fig. 2-31,2-32)

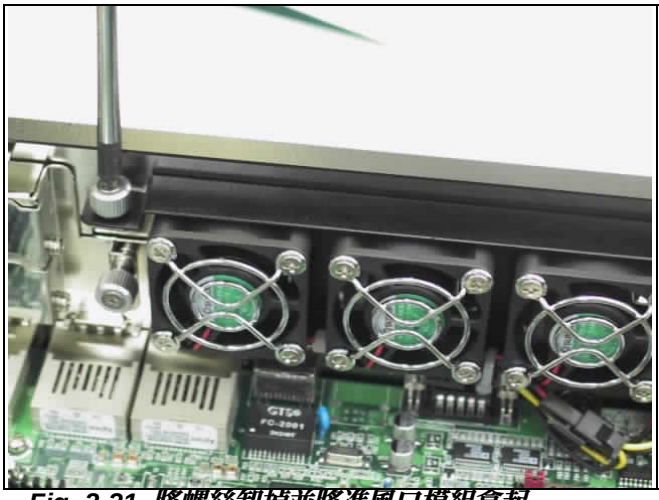


Fig. 2-31 將螺絲卸掉並將進風口模組拿起

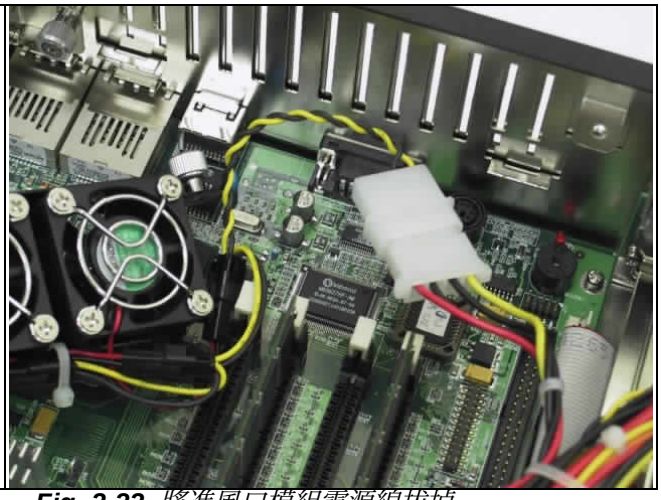


Fig. 2-32 *將進風口模組電源線拔掉*

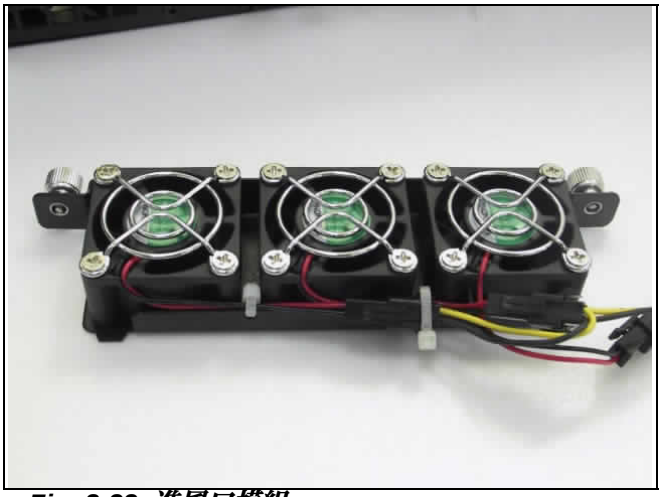


Fig. 2-33 進風口模組

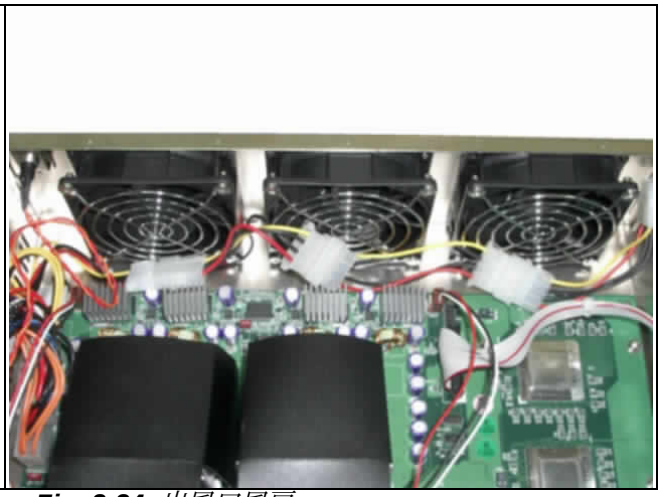


Fig. 2-34 出風口風扇

2. 背面出風口風扇建議不要自行更換,避免操作失誤,造成其他問題.(Fig. 2-34)
3. 按照相反步驟即可安裝回去.

2.12 Remove and Install LCD module & cable

請按照步驟操作,避免損壞
1.將 LCD module 固定螺絲卸下,並將 LCD cable 及小 4P 電源線拔掉,即可卸下 LCD module.(Fig. 2-35,2-36,2-37)

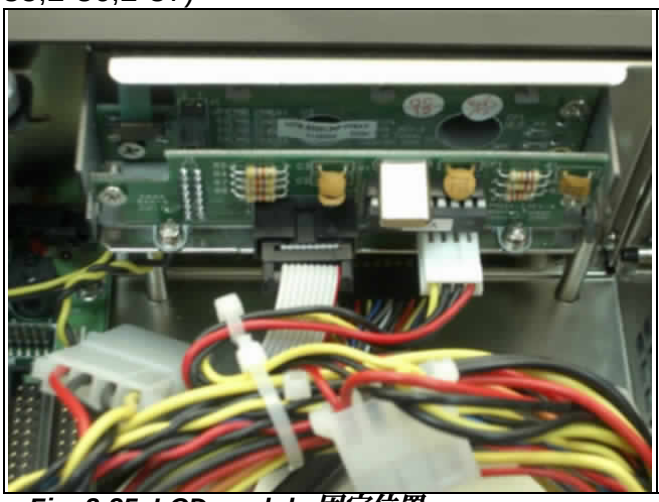


Fig. 2-35 LCD module 固定位置

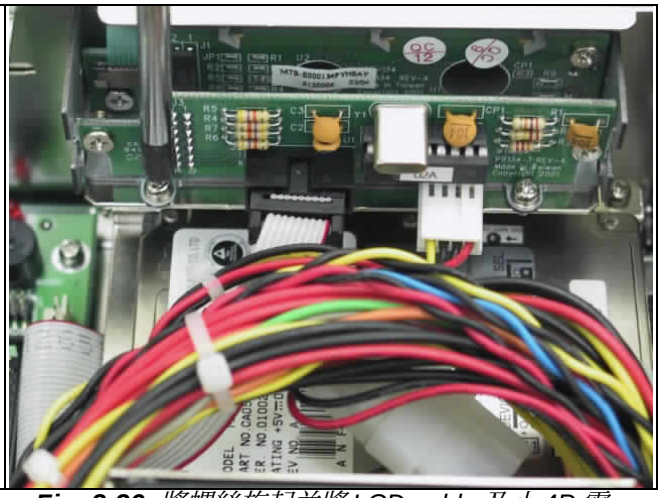


Fig. 2-36 將螺絲旋起並將 LCD cable 及小 4P 電源線取下

Fig. 2-37 即可取下 LCD module

2.13 Product Specifications

Model:	**NAR-7061**
Processor:	• Dual Intel® Xeon™ Processors (1.6 GHz – 2.4 GHz) with 512KB L2 Cache
Memory:	• 512MB PC1600 DDR RAM module, upgradeable to 4GB
BIOS:	• Award system BIOS with 512KB flash ROM
I/O Ports	• Three Gigabit Ethernet ports • Three 10/100 BASE-T Ethernet ports • One RS-232 system console • Two USB ports
Storage Device	• One 2.5” HDD
Expansion	• One 64bit PCI-X slot
LCD Panel	• 2X16 LCD module with six-button keypad
LED	• LED indicators for power, HDD and Ethernet ports
Power	• 350W ATX PSU
Cooling	• Two 7cm FAN for CPU cooling • three 4cm FAN and three 8cm System FAN
Operating Environment	• Temperature: 0 to 45℃ • Humidity: 5% to 95% RH
Dimension	• 431.0(W) x 408.0(D) x 88.0(H) mm • 17.00”(W) x 16”(D) x 3.46”(H)
Safety	• CE/FCC • LVDs

2.14 Hardware Configuration Setting

This section gives the definitions and shows the positions of jumpers, headers and connectors. All of the configuration jumpers on PPAP-3720 are in the proper position. The default settings set by factory are marked with a star (★).

Jumpers

In general, jumpers on PPAP-3720 system board are used to select options for certain features. Some of the jumpers are configurable for system enhancement. The others are for testing purpose only and should not be altered. To select any option, cover the jumper cap over (Short) or remove (NC) it from the jumper pins according to the following

instructions. Here NC stands for “Not Connected”. (Please refer to ***Fig. 2-28*** for detailed jumper positions.)

Jumper Setting Table (JP1-JP9)

JP1	BUZZER	Default Setting
Short	ENABLE	★
N/C	DISABLE	

JP2	TCO TIMER	Default Setting
Short	ENABLE	
N/C	DISABLE	★

JP3	BIOS WRITE PROTECT	Default Setting
Short	WRITE ENABLE	★
N/C	WRITE PROTECT	

JP4	CPU SAFE MODE	Default Setting
Short	ENABLE	
N/C	DISABLE	★

JP5	CMOS CLEAR	Default Setting
1-2	NORMAL	★
2-3	CLEAR	

JP6	ITP Port	Default Setting
1-2	DUAL PROCESSOR	★
2-3	SINGLE PROCESSOR	

JP7	VRM	Default Setting
1-2	ENABLE	★
2-3	RESERVE	

JP8	MANUAL VID SETTING	Default Setting
	RESERVE FOR DEBUGGING	

JP3	FAN POWER	Default Setting
1-2	+12V	★
2-3	+5V	

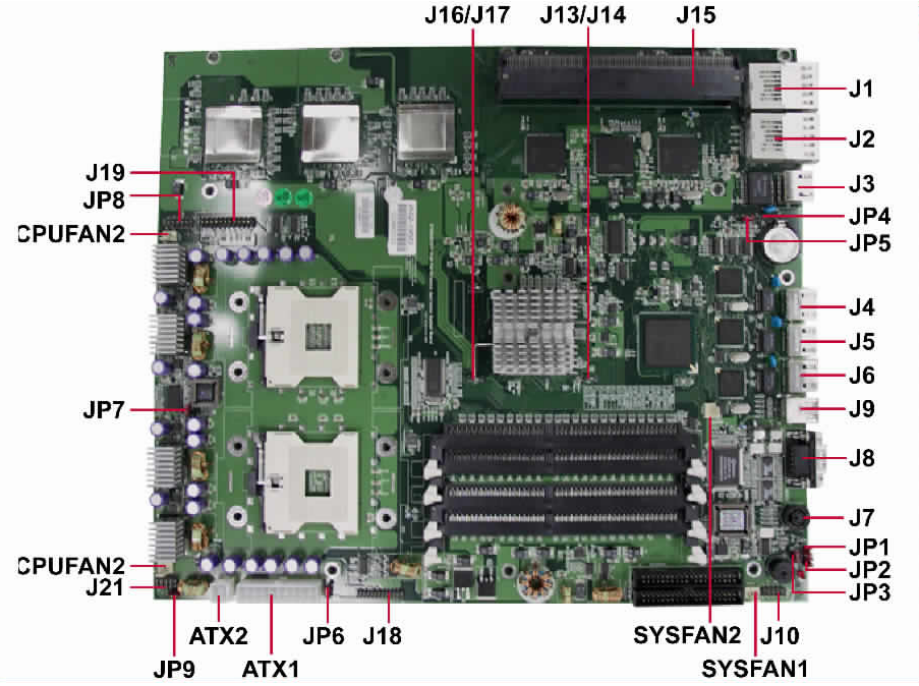


Fig. 2-28 Jumper Position

Connectors

Devices are connected through these connectors which includes IDE, COM Port etc…

Connector	Function	Remark
J1	COPPER GIGABIT	
J2	COPPER GIGABIT	
J3	COPPER GIGABIT	
J4	10/100M Bits RJ45	
J5	10/100M Bits RJ45	
J6	10/100M Bits RJ45	
J7	Internal PS/2 KB/MOUSE Connector	
J8	D Type COM1 Connector	
J9	Stack Dual USB Connector	
J10	FWH Connector for Debugging	
J13	Hook for MCH Heatsink	
J14	Hook for MCH Heatsink	
J15	PCI-X Slot	
J16	Hook for MCH Heatsink	
J17	Hook for MCH Heatsink	
J18	ITP Port	
J19	Connector for LED board	
J21	COM2 Header 5X2 for LCD module	
ATX1	ATX Power Connector	
ATX2	12V Power Connector	
CPUFAN1	CPU FAN Power Connector	

CPUFAN2	CPU FAN Power Connector	
SYSFAN1	SYSTEM FAN Power Connector	
SYSFAN2	SYSTEM FAN Power Connector	

2.15 Install a Different Processor

Install CPU

1. Lift the handling lever of CPU socket outwards and upwards to the other end.
2. Align the processor pins with holes on the socket. Make sure that the notched corner or dot mark (pin 1) of the CPU corresponds to the socket's bevel end. Then press the CPU gently until it fits into place. If this operation is not easy or smooth, don't do it forcibly. You need to check and rebuild the CPU pin uniformly.
3. Push down the lever to lock processor chip into the socket.
4. Follow the installation guide of cooling fan or heat sink to mount it on CPU surface and lock it on the socket 603.
5. Be sure to follow particular CPU speed and voltage type to adjust the jumper settings properly for all boards.

Remove CPU

1. Unlock the cooling fan first.
2. Lift the lever of CPU socket outwards and upwards to the other end.
3. Carefully lift up the existing CPU to remove it from the socket.
4. Follow the steps of CPU installation to change to another one or place handling bar to close the opened socket.

Configure Processor Speed

Enter BIOS browser to select Frequency/Voltage Control, and then change CPU Clock Ratio to be 20X.

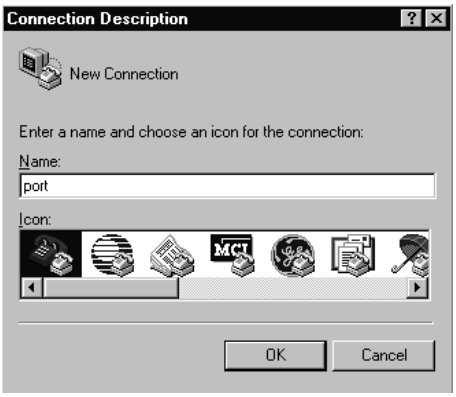
2.16 Connect to the console

Connection Using Hyper Terminal

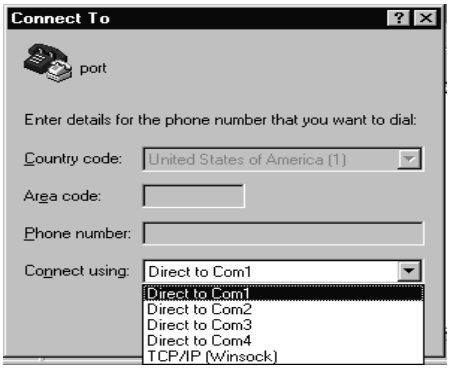
If users use a headless NAR-7061, which has no mouse/keyboard and VGA output connected to it, the console may be used to communicate with NAR-7061.

To access NAR-7061 via the console, Hyper Terminal is one of the choices. Follow the steps below for the setup:

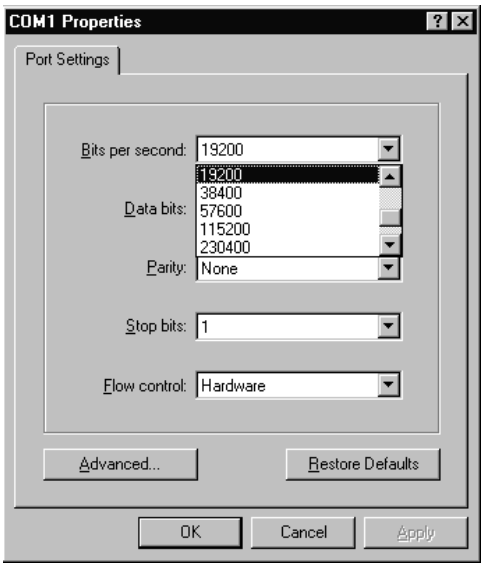
1. Execute HyperTerminal under C:\Program Files\Accessories\HyperTerminal
2. Enter a name to create new dial



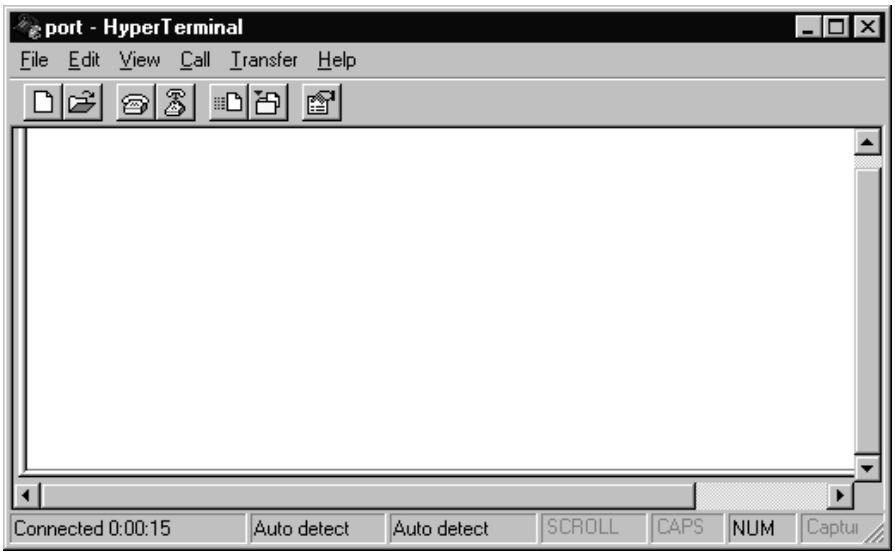
3. For the connection settings, make it Direct to Com1.



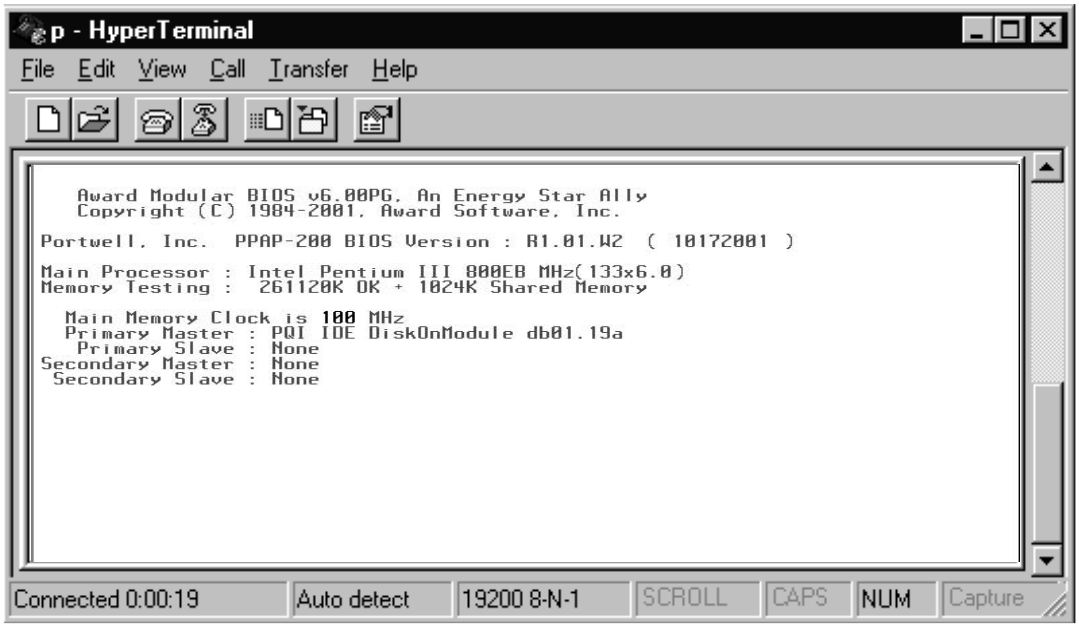
4. Please make the port settings to Baud rate 19200, Parity None, Data bits 8, Stop bits 1



5. Turn on the power of NAR-7061, after following screen was shown



6. You can then see the boot up information of NAR-7061



7. This is the end of this section. If the terminal did not port correctly, please check the previous steps.

Chapter 3 Operation Guide

3.1 Brief Guide of PPAP-3720

PPAP-3720 is a Communication Appliance computing board based on Intel® E7500 chipset technology. PPAP-3720 has six on-board Ethernet to serve communication appliances, such as Firewall, which needs three Ethernet ports to connect external network (internet), demilitarized zone and internal network. Different I/O management policies can be applied respectively to individual network to achieve the highest security level. One built-in PCI-X slot permits further expansion for WAN connection, backup connection or even customized function card. The target market segment is communication appliance including Virtual Private Network, Load Balancing, Quality of Service, Intrusion Detection, Virus Detection, Firewall and Voice Over IP.

This PPAP-3720 system board is eligible with Intel® Xeon processors, and 184-pin DDR DIMM up to 4GB DDR RAM. The enhanced on-board PCI IDE interface supports 4 drives up to PIO mode 4 timing and Ultra DMA/100 synchronous mode feature. The on-board super I/O chipset integrates two serial ports driven by two high performance 16C550-compatible UARTs to provide 16-byte send/receive FIFOs. Besides, the two Universal Serial Bus ports provide high-speed data communication between peripherals and PC.

The on-board flash ROM is used to make the BIOS update easier. The high precision Real Time Clock/Calendar is built to support Y2K for accurate scheduling and storing configuration information. All of these features make PPAP-3720 excellent in stand-alone applications.

If any of these items is damaged or missing, please contact your vendor and save all packing materials for future replacement and maintenance.

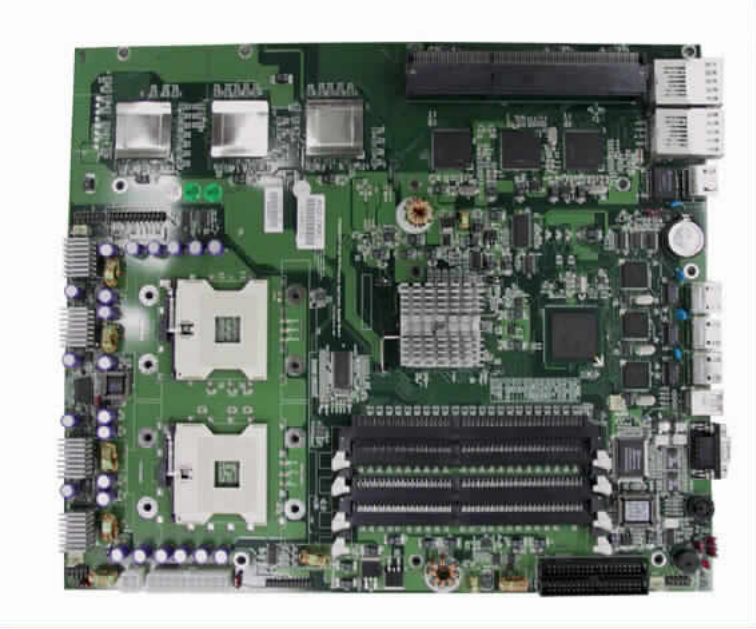


Fig. 3-1 PPAP-3720 Board

3.2 System Architecture

The following illustration of block diagram will show you how PPAP-3720 gives you a highly integrated system solution. The most up-to-date system architecture of PPAP-3720 includes two main VLSI chips. It contains E7500MCH and ICH3 to support Xeon processor, DDR DIMM, PCI bus interface, USB port, SMBus communication, and Ultra DMA/100 IDE Master. The on-board super I/O chip Winbond W83627HF supports two UARTs, FDC, parallel port and hardware monitoring.

PPAP-3720 has built-in Socket 603/604 to support Intel Xeon processor for cost-effective and high performance application. However.

The E7500 MCH provides a completely integrated solution for the system controller and data path components in a Xeon processor system. It provides optimized 64-bit DDR RAM interface.

The ICH3 provides a highly integrated multifunction for the best industry applications. It supports 2-channel dedicated Ultra ATA/33/66/100 IDE master interface, Universal Serial Bus **(USB)** controllers and one 64-bit PCI bus interface.

All detailed operating relations are shown in ***Fig. 3-2*** .(PPAP-3720 System Block Diagram)

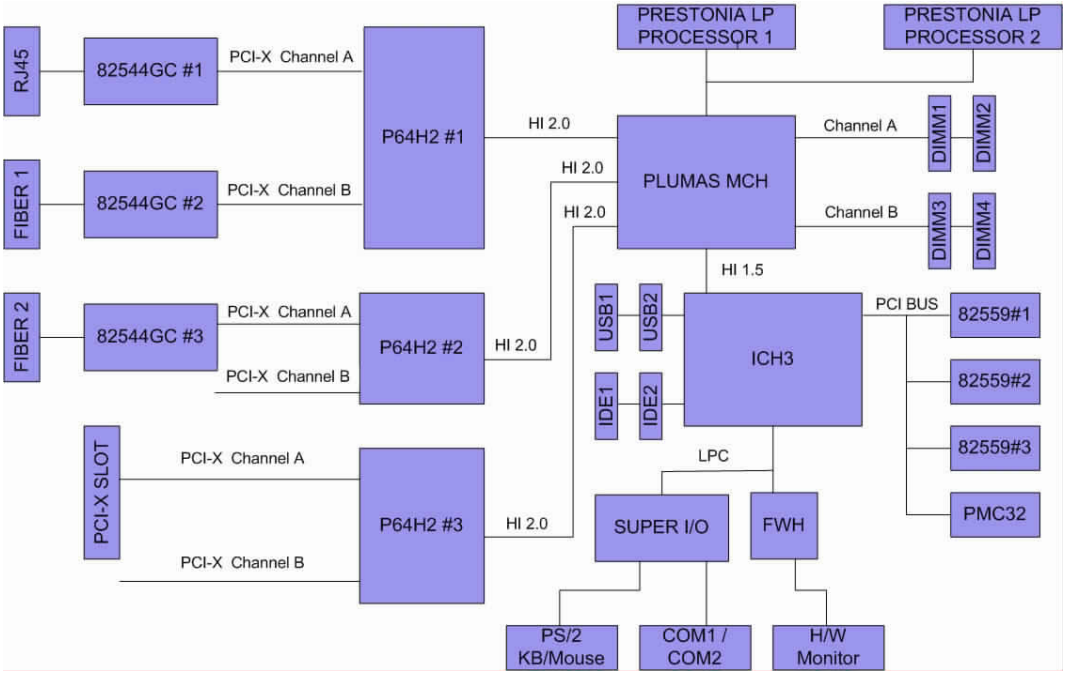


Fig. 3-2 PPAP-3720 E7500 Block Diagram

CHAPTER 4

BIOS Setup Information

NAR-7061 is equipped with the AWARD BIOS stored in Flash ROM. This BIOS has a built-in Setup program that allows users to modify the basic system configuration easily. This type of information is stored in CMOS RAM so that it is retained during power-off periods. When system is turned on, NAR-7061 communicates with peripheral devices and check its hardware resources against the configuration information stored in the CMOS memory. If any error is detected, or the CMOS parameters need to be initialiged, the diagnostic program will prompt the user to enter the SETUP program. Some errors are significant enough to abort the start-up.

4-1 Entering Setup

Turn on or reboot the computer. When the message “Hit <DEL> if you want to run SETUP” appears, press <Del> key immediately to enter BIOS setup program.

If the message disappears before you respond, but you still wish to enter Setup, please restart the system to try “COLD START” again by turning it OFF and then ON, or touch the "RESET" button. You may also restart from “WARM START” by pressing <Ctrl>, <Alt>, and <Delete> keys simultaneously. If you do not press the keys at the right time and the system will not boot, an error message will be displayed and you will again be asked to,

Press <F1> to Run SETUP or Resume

In BIOS setup, you can use the keyboard to choose among options or modify the system parameters to match the options with your system. The table below will show you all of keystroke functions in BIOS setup.

Keys to navigate within setup menu

Key	Functions
Up Arrow	Move to the previous item
Down Arrow	Move to the next item
Left Arrow	Move to the item on the left (menu bar)
Right Arrow	Move to the item on the right (menu bar)
Move Enter	Move to the item you desired
PgUp key	Increase the numeric value or make changes
PgDn key	Decrease the numeric value or make changes
+ key	Increase the numeric value or make changes
- key	Decrease the numeric value or make changes
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
F1 key	General help on Setup navigation keys
F5 key	Load previous values from CMOS
F6 key	Load the fail-safe defaults from BIOS default table
F7 key	Load the optimized defaults
F10 key	Save all the CMOS changes and exit

4-2 Main Menu

Once you enter NAR-7061 AWARD BIOS CMOS Setup Utility, you should start with the Main Menu. The Main Menu allows you to select from eleven setup functions and two exit choices. Use arrow keys to switch among items and press <Enter> key to accept or bring up the sub-menu.

Phoenix – Award WorkstationBIOS CMOS Setup Utility

Standard CMOS Features	Frequency/Voltage Control
Advanced BIOS Features	Load Fail-Safe Defaults
Advanced Chipset Features	Load Optimized Defaults
Integrated Peripherals	Set Supervisor Password
Power Management Setup	Set User Password
PnP/PCI Configurations	Save & Exit Setup
PC Health Status	Exit Without Saving

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

Time, Date, Hard Disk Type….

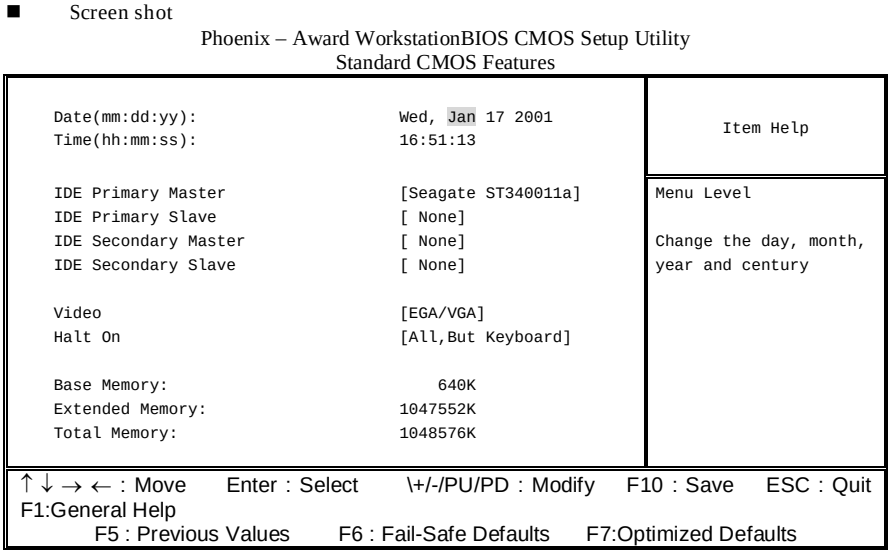
NOTE : It is strongly recommended to reload the Optimized Default Setting if CMOS is lost or BIOS is updated.

4-3 Standard CMOS Features

This setup page includes all the items in a standard compatible BIOS. Use the arrow keys to highlight the item and then use the <PgUp>/<PgDn> or <+>/<-> keys to select the value or number you want in each item and press <Enter> key to certify it.

Follow command keys in CMOS Setup table to change Date, Time, Drive type, and Boot Sector Virus Protection Status.

- Screen shot



- Menu seletions

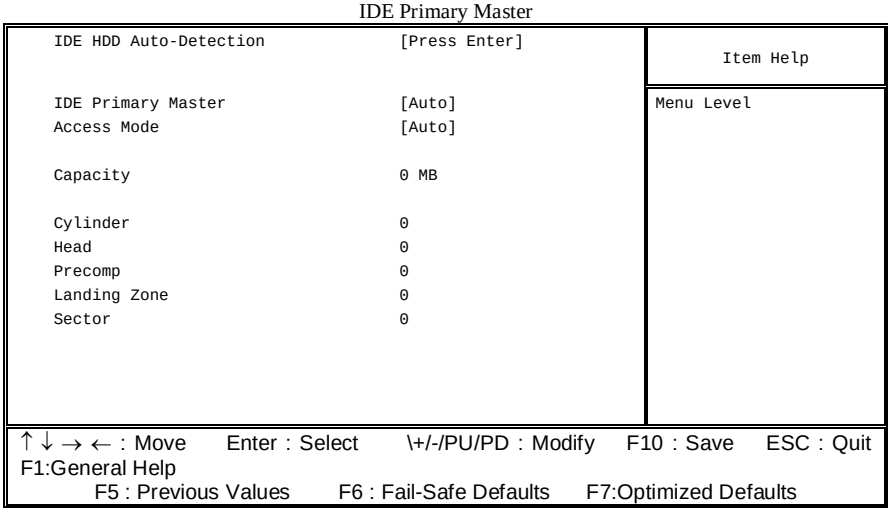
Item	Options	Description
Date	Mm:dd:yy	Set the system date. Note that the 'Day' automatically changes when you set the date
Time	Hh:mm:ss	Set the system time
IDE Primary Master	-	Press [Enter] to enter Primary Master IDE configuration
IDE Primary Slave	-	
IDE Secondary Master	-	
IDE Secondary Slave	-	
Video	EGA/VGA CGA 40 CGA 80 MONO	Select the default video device
Halt On	All Errors No Errors All, but Keyboard All, but Diskette	Select the situation in which you want the BIOS to stop the POST process and notify you

	All, but Disk/Key	

Item	Options	Description
Base Memory	N/A	Displays the amount of conventional memory detected during boot up
Extended Memory	N/A	Displays the amount of extended memory detected during boot up
Total Memory	N/A	Displays the total memory available in the system

- IDE Primary Master Screen shot

Phoenix – Award WorkstationBIOS CMOS Setup Utility
IDE Primary Master



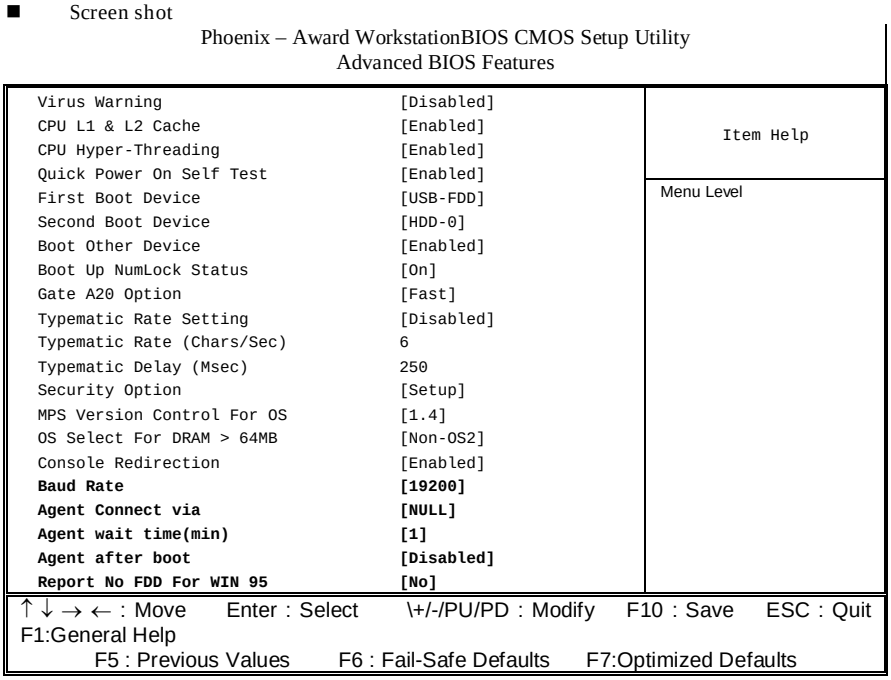
- Menu seletions

Item	Options	Description
IDE HDD Auto-Detection	-	Auto-detection HDD type
IDE Primary Master	None Auto Manual	Select HDD dectection mode
Access Mode	CHS LBA Large Auto	Select HDD access mode
Capacity	-	Number of capacity
Cylinder	-	Number of cylinders
Head	-	Number of heads
Precomp	-	Write precomp
Landing Zone	-	Landing zone
Sector	-	Number of sector

4-4 Advanced BIOS Features

This section allows you to configure your system for basic operation. You have the opportunity to select the system's default speed, boot-up sequence, keyboard operation, security.

- Screen shot



- Menu seletions

Item	Options	Description
Virus Warning	Enabled Disabled	Allows you to choose the VIRUS warning feature for IDE Hard Disk boot sector protection. If this function is enabled and someone attempt to write data into this area , BIOS will show a warning message on screen and alarm beep
CPU L1 & L2 Cache	Enabled Disabled	These two categories speed up memory access. However, it depends on CPU/chipset design.
CPU Hyper-Threading	Enabled Disabled	Enabled will allow one physical CPU emulate dual virtual processors.
Quick Power On Self Test	Enabled Disabled	Allows the system to skip certain tests while booting. This will speed up system boot.
First Boot Device	Floppy LS120 HDD-0 SCSI CDROM HDD-1	Select Your First Boot Device Priority.

	HDD-2 HDD-3 ZIP100 USB-FDD USB-ZIP USB-CDROM USB-HDD LAN Disabled.	
Second Boot Device	Floppy LS120 HDD-0 SCSI CDROM HDD-1 HDD-2 HDD-3 ZIP100 USB-FDD USB-ZIP USB-CDROM USB-HDD LAN Disabled.	Select Your Second Boot Device Priority.
Boot Other Device	Enabled Disabled	Select Your Boot Device Priority.
Boot Up NumLock Status	On Off	Select power on state for NumLock.
Gate A20 Option	Normal Fast	This entry allows you to select how the gate A20 is handled. The gate A20 is a device used to address memory above 1 Mbytes. Initially, the gate A20 was handled via a pin on the keyboard. Today, while keyboards still provide this support, it is more common, and much faster, for the system chipset to provide support for gate A20.
Typematic Rate Setting	Enabled Disabled	Key strokes repeat at a rate determined by the keyboard controller. When enabled, the typematic rate and typematic

		delay can be selected.
Typematic Rate (Chars/Sec)	6 8 10 12 15 20 24 30	Sets the number of times a second to repeat a key stroke when you hold the key down.
Typematic Delay (Msec)	250 500 750 1000	Sets the delay time after the key is held down before it begins to repeat the keystroke.
Security Option	System Setup	Select whether the password is required every time the system boots or only when you enter setup.
MPS Version Control For OS	1.1 1.4	Multiprocessor spec revision the BIOS support.
OS Select For DRAM > 64MB	Non-OS2 OS2	Select the OS2 only if you are running OS/2 operating system with greater than 64MB of RAM on the system.
Console Redirection	Enabled Disabled	Enabled – Attempt to redirect console via COM port. Disabled – Attempt to redirect console when keyboard absent.
Baud Rate	9600 19200 38400 57600 115200	Specify Baud Rate of console redirection
Agent Connect via	NULL	Connection modes: NULL – Direct connection agent wait time.
Agent wait time(min)	1 2 4 8	Timeout for connection
Agent after boot	Enabled Disabled	Keep Agent running after OS boot

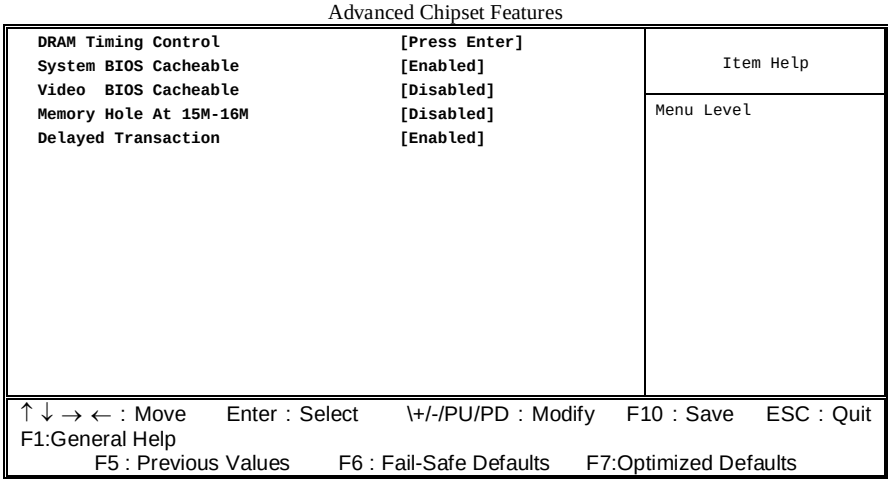
Report No FDD For WIN 95	Yes No	

4-5 Advanced Chipset Features

This section allows you to configure the system based on the specific features of the Intel E7500 chipset. This chipset manages bus speeds and access to system memory resources, such as DDR RAM and the external cache. It must be stated that these items should never need to be altered. The default settings have been chosen because they provide the best operating conditions for your system. The only time you might consider making any changes would be if you discovered that data was being lost while using your system.

- Screen shot

Phoenix – Award WorkstationBIOS CMOS Setup Utility
Advanced Chipset Features



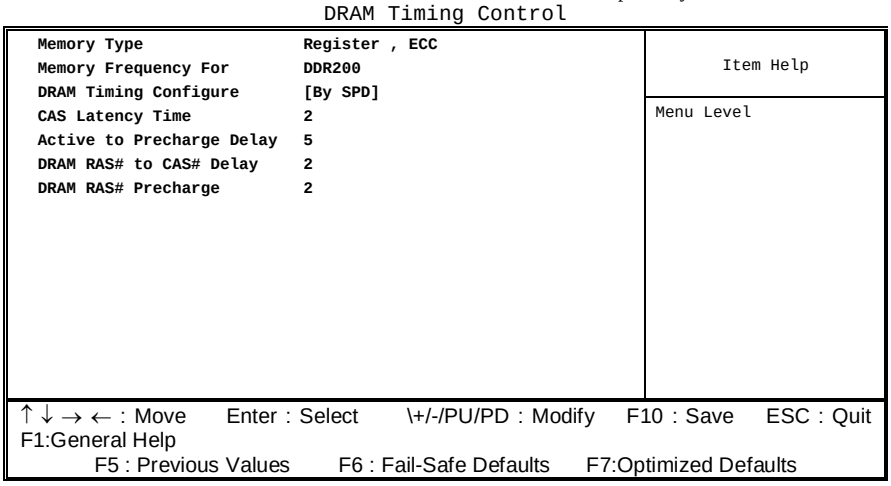
This chipset settings deal with CPU access to dynamic random access memory (DRAM). The default timings have been carefully chosen and should only be altered if data is being lost.The proper memory modules combination should follow user's manual.

- Menu seletions

Item	Options	Description
DRAM Timing Control	-	
System BIOS Cacheable	Enabled Disabled	Selecting Enabled allows caching of the system BIOS ROM at F0000h-FFFFFh, resulting in better system performance. However, if any program writes to this memory area, a system error may result.
Video BIOS Cacheable	Enabled Disabled	Enabled will speed up video BIOS cord access.
Memory Hole At 15M-16M	Enabled Disabled	In order to improve performance, certain space in memory is reserved for ISA cards. This memory must be mapped into the memory space below 16MB.
Delayed Transaction	Enabled Disabled	PCI bus option.

- Screen shot

Phoenix – Award WorkstationBIOS CMOS Setup Utility
DRAM Timing Control



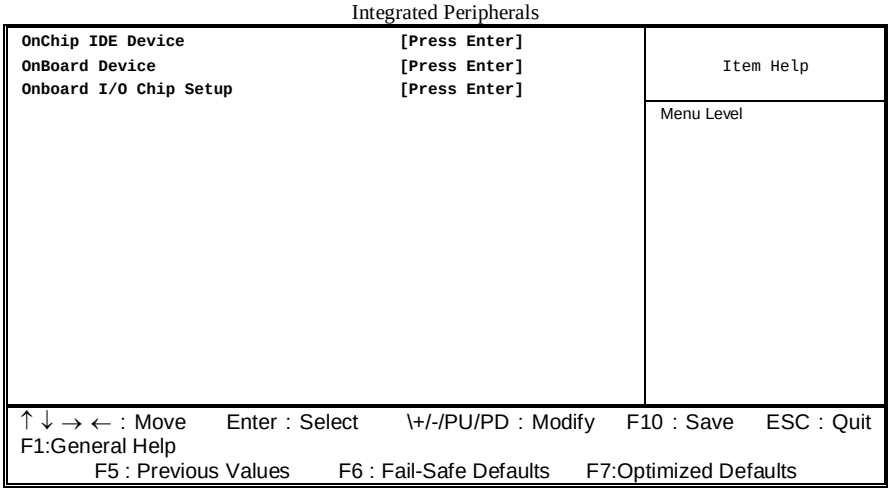
■ Menu seletions

Item	Options	Description
Memory Type	-	
Memory Frequency For	-	
DRAM Timing Configure	Manual By SPD	Manualfactur don't recommend change default manu.
CAS Latency Time	1.5 2 2.5	Manualfactur don't recommend change default manu.
Active to Precharge Delay	7 6 5	Manualfactur don't recommend change default manu.
DRAM RAS# to CAS# Delay	3 2	Manualfactur don't recommend change default manu.
DRAM RAS# Precharge	3 2	Manualfactur don't recommend change default manu.

4-6 Integrated Peripherals

■ Screen shot

Phoenix – Award WorkstationBIOS CMOS Setup Utility
Integrated Peripherals

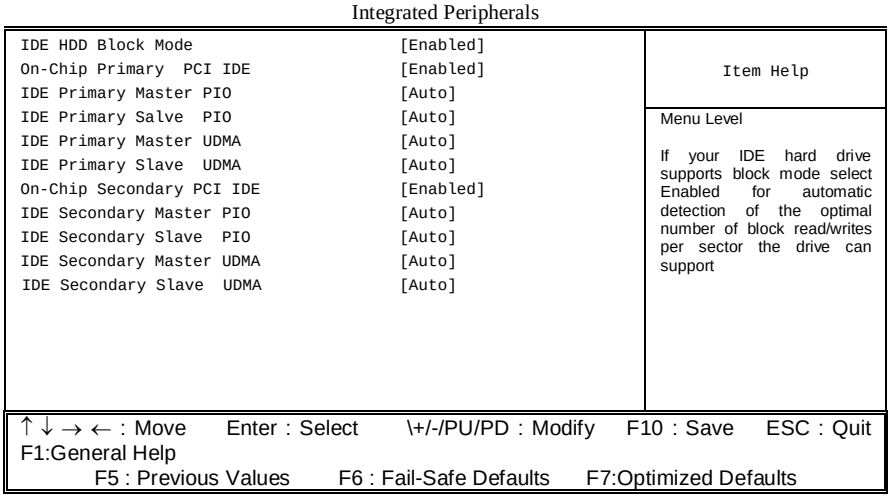


■ Menu seletions

Item	Options	Description
OnChip IDE Device	-	Press [Enter] to onchip IDE device configuration.
Onboard Device	-	Press [Enter] to onboard USB device configuration.
Onboard I/O Chip Setup	-	Press [Enter] to onboard I/O device configuration.

■ Screen shot

Phoenix – Award WorkstationBIOS CMOS Setup Utility
Integrated Peripherals



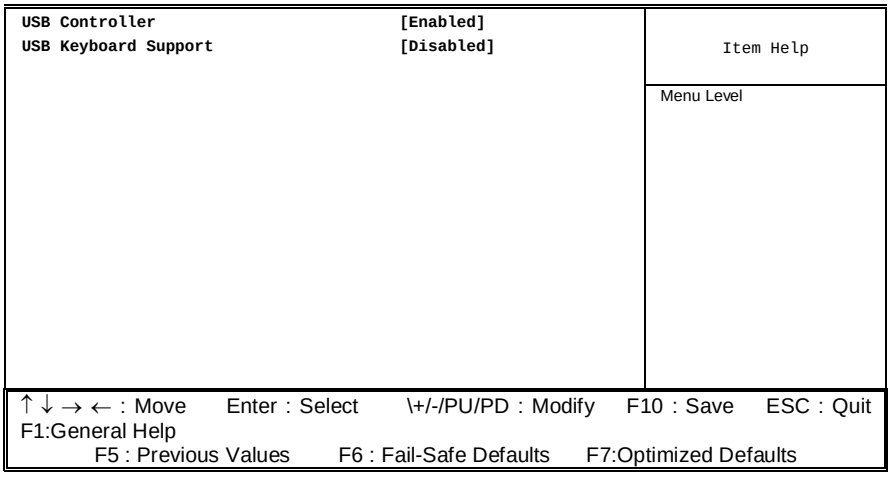
■ Menu seletions

Item	Options	Description
IDE HDD Block Mode	Enabled Disabled	This item allows you to enable/disable IDE HDD Block Mode. The function is to collect the data that is nearby the one being read and leave them in the system buffer. Buffered data can be used with faster transmission rate so as to enhance system performance.

On-Chip Primary/Secondary PCI IDE	Enabled Disabled	The chipset contains a PCI IDE interface with support for two IDE channels. Select Enabled to activate the primary IDE interface. Select Disabled to deactivate this interface
IDE Primar/Secondary Master/Slave PIO	Auto Mode 0 Mode 1 Mode 2 Mode 3 Mode 4	The four IDE PIO (Programmed Input/Output) fields let you set a PIO mode (0-4) for each of the four IDE devices that the onboard IDE interface supports. Modes 0 through 4 provide successively increased performance. In Auto mode, the system automatically determines the best mode for each device.
IDE Primary/Secondary Master/Slave UDMA	Auto Disabled	For UDMA hard disk.

- Screen shot

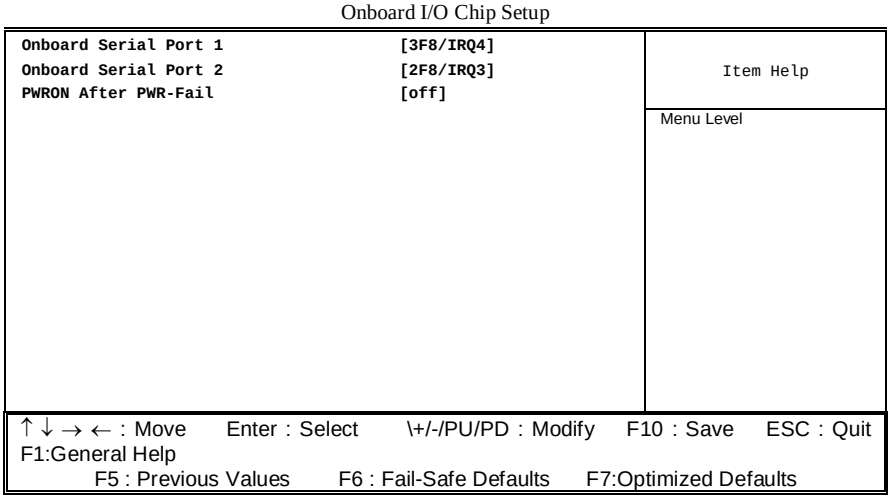
Phoenix – Award WorkstationBIOS CMOS Setup Utility
Onboard Device



- Menu seletions

Item	Options	Description
USB Controller	Enabled Disabled	
USB Keyboard Support	Enabled Disabled	This item allows you to enable USB keyboard function under POST, BIOS setup menu, DOS, or Windows-NT with no USB driver loaded

- Screen shot



■ Menu seletions

Item	Options	Description
Onboard Serial Port 1/Port 2	3F8/IRQ4 2E8/IRQ3 3E8/IRQ4 2F8/IRQ3 Disabled Auto	Select an address and corresponding interrupt for the first and second serial ports.
PWRON After PWR-Fail	Off On Former-Sts	This option define the state while power resume after power lose. Off: the system will stay off affer power resume. On: the system will stay on affer power resume. Former-sts: the system will stay system former-sts affer power resume.

4-7 Power Management Setup

The Power Management Setup allows you to configure you system to most effectively save energy while operating in a manner consistent with your own style of computer use.

- Screen shot

Phoenix – Award WorkstationBIOS CMOS Setup Utility
Power Management Setup

ACPI Function	**[Enabled]**	Item Help
Power Management	**[User Define]**	
Video Off Method	**[DPMS]**	Menu Level
Video Off In Suspend	**[Yes]**	
Suspend Type	**[Stop Grant]**	
MODEM Use IRQ	**[3]**	
Suspend Mode	**[Disabled]**	
HDD Power Down	**[Disabled]**	
Soft-Off by PWR-BTTN	**[Instant-Off]**	
Power On by Ring	**[Enabled]**	
Resume by Alarm	**[Disabled]**	
Date(of Month) Alarm	**0**	
Time(hh:mm:ss) Alarm	**0 : 0 : 0**	
**** Reload Global Timer Events ****		
Primary IDE 0	**[Disabled]**	
Primary IDE 1	**[Disabled]**	
Secondary IDE 0	**[Disabled]**	
Secondary IDE 1	**[Disabled]**	
FDD,COM,LPT Port	**[Disabled]**	
PCI PIRQ[A-D]#	**[Disabled]**	

↑ ↓ → ← : Move Enter : Select \+/-/PU/PD : Modify F10 : Save ESC : Quit
F1:General Help
F5 : Previous Values F6 : Fail-Safe Defaults F7:Optimized Defaults

- Menu seletions

Item	Options	Description
ACPI Function	Enabled Disabled	
Power Management	User Define Min Saving Max Saving	This category allows you to select the type (or degree) of power saving and is directly related to “HDD Power Down”, “Suspend Mode”. There are three selections for Power Management, three of which have fixed mode settings.
Video Off Method	Blank Screen V/H SYNC+Blank DPMS	
Video Off In Suspend	Yes No	
Suspend Type	Stop Grant PwrOn Suspend	
MODEM Use IRQ	NA 3 4	

	5 7 9 10 11	
Suspend Mode	Disabled 1 Min 2 Min 4 Min 8 Min 12 Min 20 Min 30 Min 40 Min 1 Hour	When enabled and after the set time of system inactivity, all devices except the CPU will be shut off.
HDD Power Down	Disabled 1 Min – 15 Min	
Soft-Off by PWR-BTTN	Instant-Off Delay 4 Sec	This item allows users to set the time to remove the power after the power button is pressed.
PowerON by Ring	Enabled Disabled	When select “Enabled”, a system that is at soft-off mode will be alert to Wake-On-Lan or Wake-On-Modem signal.
Resume by Alarm	Enabled Disabled	
Date(of Month) Alarm	0 - 31	
Time(hh:mm:ss) Alarm	Time	
Primary IDE 0/IDE 1	Enabled Disabled	
Secondary IDE 0/IDE 1	Enabled Disabled	
FDD,COM,LPT Port	Enabled Disabled	
PCI PIRQ[A-D]#	Enabled Disabled	

4-8 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.

- Screen shot

Phoenix – Award WorkstationBIOS CMOS Setup Utility
PnP/PCI Configurations

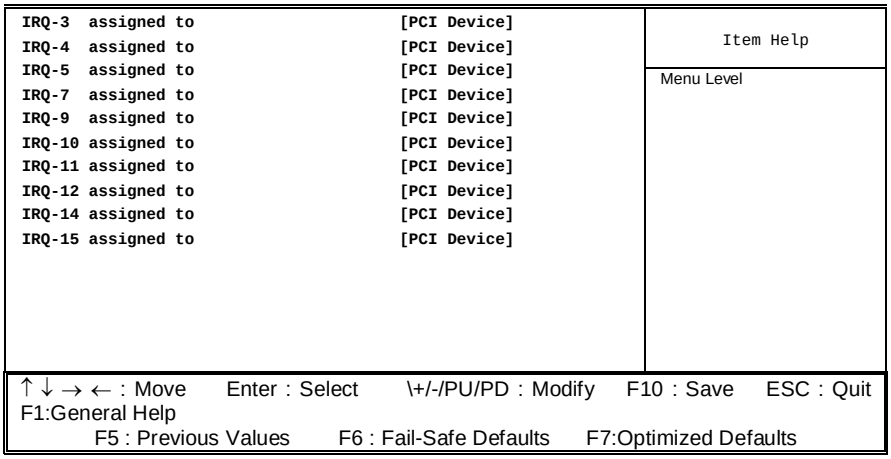
Reset Configuration Data	**[Disabled]**	Item Help
Resources Controlled By	**[Auto(ESCD)]**	Menu Level
IRQ Resources	**Press Enter**	
PCI/VGA Palette Snoop	**[Disabled]**	Default is Disabled. Select Enabled to reset Extended System Configuration Data (ESCD) when you exit Setup if you have installed a new add-on and the system reconfiguration has caused such a serious conflict that the OS cannot boot

↑ ↓ → ← : Move Enter : Select \+/-/PU/PD : Modify F10 : Save ESC : Quit
F1:General Help
F5 : Previous Values F6 : Fail-Safe Defaults F7:Optimized Defaults

- Menu seletions

Item	Options	Description
Reset Configuration Data	Enabled Disabled	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 card and the system reconfiguration has caused such a serious conflict that the operating system can not boot.
Resource Controlled By	Auto(ESCD) Manual	The Award Plug and Play BIOS has the capacity to automatically configure all of the boot and Plug and Play compatible devices. However, this capability means absolutely nothing unless you are using a Plug and Play operating system such as Windows®95. If you set this field to “manual” choose specific resources by going into each of the sub menu that follows this field (a sub menu is preceded by a “➢”).
IRQ Resources		
PCI/VGA Palette Snoop	Enabled Disabled	

- Screen shot



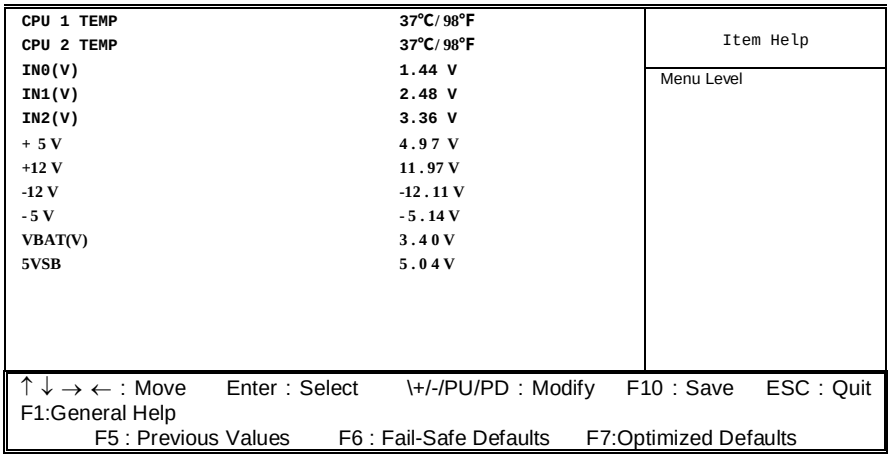
■ Menu seletions

Item	Options	Description
IRQ-3 –IRQ-15 assigned to	PCI Device Reserved	Legacy ISA for devices compliant with the original PC AT bus specification, PCI/ISA PnP for devices compliant with the Plug and Play standard whether designed for PCI or ISA bus architecture

4-9 PC Health Status

- Screen shot

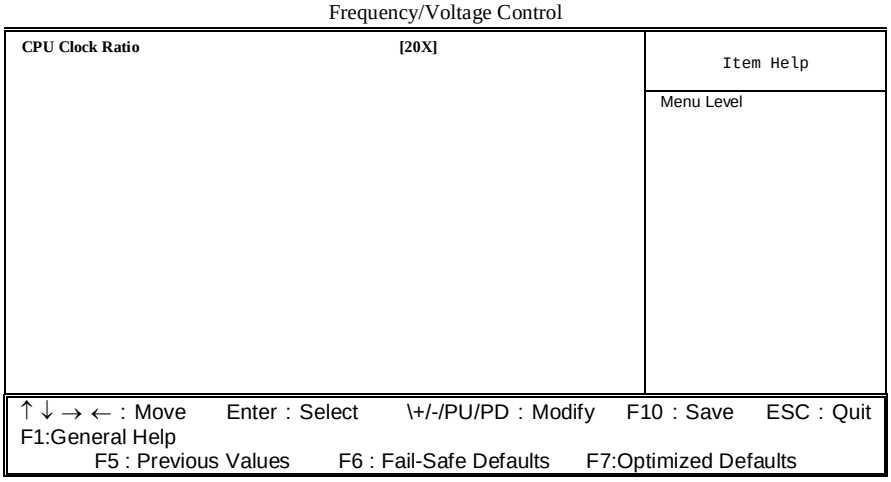
Phoenix – Award WorkstationBIOS CMOS Setup Utility
PC Health Status



4-10 Frequency / Voltage Control

- Screen shot

Phoenix – Award WorkstationBIOS CMOS Setup Utility
Frequency/Voltage Control



- Menu seletions

Item	Options	Description
CPU Clock Ratio	16 – 20	

4-9 Default Menu

Selecting "Defaults" from the main menu shows you two options which are described below

Load Fail-Safe Defaults
When you press <Enter> on this item you get a confirmation dialog box with a message similar to:

Load Fail-Safe Defaults (Y / N) ? N

Pressing 'Y' loads the BIOS default values for the most stable, minimal-performance system operations.

Load Optimized Defaults
When you press <Enter> on this item you get a confirmation dialog box with a message similar to:

Load Optimized Defaults (Y / N) ? N

Pressing 'Y' loads the default values that are factory settings for optimal performance system operations.

4-10 Setup Supervisor Password

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

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

ENTER PASSWORD

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

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

PASSWORD DISABLED

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

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

You determine when the password is required within the BIOS Features Setup Menu and its Security option (see Section 3). If the Security option is set to "System", the password will be required both at boot and at entry to Setup. If set to "Setup", prompting only occurs when trying to enter Setup.

4-11 Exiting Seleting

Save & Exit Setup

Pressing <Enter> on this item asks for confirmation:

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

Pressing "Y" stores the selections made in the menus in CMOS – a special section of memory that stays on after you turn your system off. The next time you boot your computer, the BIOS configures your system according to the Setup selections stored in CMOS. After saving the values the system is restarted again.

Exit Without Saving

Pressing <Enter> on this item asks for confirmation:

Quit without saving (Y/N)? Y

This allows you to exit Setup without storing in CMOS any change. The previous selections remain in effect. This exits the Setup utility and restarts your computer.

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

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

POST Beep

Currently there are two kinds of beep codes 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. The other code indicates that your DRAM error has occurred. This beep code consists of a single long beep repeatedly.

Error Messages

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

CMOS BATTERY HAS FAILED

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

CMOS CHECKSUM ERROR

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

DISK BOOT FAILURE, INSERT SYSTEM DISK AND PRESS ENTER

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

DISKETTE DRIVES OR TYPES MISMATCH ERROR - RUN SETUP

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

DISPLAY SWITCH IS SET INCORRECTLY

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

DISPLAY TYPE HAS CHANGED SINCE LAST BOOT

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

EISA Configuration Checksum Error PLEASE RUN EISA

CONFIGURATION UTILITY

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

EISA Configuration Is Not Complete

PLEASE RUN EISA CONFIGURATION UTILITY

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

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

ERROR ENCOUNTERED INITIALIZING HARD DRIVE

Hard drive cannot be initialized. Be sure the adapter is installed correctly and all cables are correctly and firmly attached. Also be sure the correct hard drive type is selected in Setup.

ERROR INITIALIZING HARD DISK CONTROLLER

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

FLOPPY DISK CNTRLR ERROR OR NO CNTRLR PRESENT

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

Invalid EISA Configuration

PLEASE RUN EISA CONFIGURATION UTILITY

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

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

KEYBOARD ERROR OR NO KEYBOARD PRESENT

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

If you are purposely 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 parity Error at ...

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

MEMORY SIZE HAS CHANGED SINCE LAST BOOT

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

Memory Verify Error at ...

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

OFFENDING ADDRESS NOT FOUND

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

OFFENDING SEGMENT:

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

PRESS A KEY TO REBOOT

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

PRESS F1 TO DISABLE NMI, F2 TO REBOOT

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

RAM PARITY ERROR - CHECKING FOR SEGMENT ...

Indicates a parity error in Random Access Memory.

Should Be Empty But EISA Board Found

PLEASE RUN EISA CONFIGURATION UTILITY

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

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

Should Have EISA Board But Not Found

PLEASE RUN EISA CONFIGURATION UTILITY

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

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

Slot Not Empty

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

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

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

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

Wrong Board In Slot

PLEASE RUN EISA CONFIGURATION UTILITY

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

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

FLOPPY DISK(S) fail (80) → Unable to reset floppy subsystem.

FLOPPY DISK(S) fail (40) → Floppy Type dismatch.

Hard Disk(s) fail (80) → HDD reset failed

Hard Disk(s) fail (40) → HDD controller diagnostics failed.

Hard Disk(s) fail (20) → HDD initialization error.

Hard Disk(s) fail (10) → Unable to recalibrate fixed disk.

Hard Disk(s) fail (08) → Sector Verify failed.

Keyboard is locked out - Unlock the key.

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.

BIOS ROM checksum error - System halted.

The checksum of ROM address F0000H-FFFFFH is bad.

Memory test fail.

BIOS reports the memory test fail if the onboard memory is tested error.

4-13 BIOS POST Check Point List

AWARDBIOS provides all IBM standard Power On Self Test (POST) routines as well as enhanced AWARDBIOS POST routines. The POST routines support CPU internal diagnostics. The POST checkpoint codes are accessible via the Manufacturing Test Port (I/O port 80h).

Whenever a recoverable error occurs during the POST, the system BIOS will display an error message describing the message and explaining the problem in detail so that the problem can be corrected.

During the POST, the BIOS signals a checkpoint by issuing one code to I/O address 80H. This code can be used to establish how far the BIOS has executed through the power-on sequence and what test is currently being performed. This is done to help troubleshoot faulty system board.

If the BIOS detects a terminal error condition, it will halt the POST process and attempt to display the checkpoint code written to port 80H. If the system hangs before the BIOS detects the terminal error, the value at port 80H will be the last

test performed. In this case, the terminal error cannot be displayed on the screen. The following POST checkpoint codes are valid for all AWARDBIOS products with a core BIOS date of 07/15/95 version 6.27 (Enhanced).

Code	Description
CFh	Test CMOS R/W functionality.
C0h	Early chipset initialization: -Disable shadow RAM -Disable L2 cache (socket 7 or below) -Program basic chipset registers
C1h	Detect memory -Auto-detection of DRAM size, type and ECC. -Auto-detection of L2 cache (socket 7 or below)
C3h	Expand compressed BIOS code to DRAM
C5h	Call chipset hook to copy BIOS back to E000 & F000 shadow RAM.
0h1	Expand the Xgroup codes locating in physical address 1000:0
02h	Reserved
03h	Initial Superio_Early_Init switch.
04h	Reserved
05h	1. Blank out screen 2. Clear CMOS error flag
06h	Reserved
07h	1. Clear 8042 interface 2. Initialize 8042 self-test

Code	Description
08h	1. Test special keyboard controller for Winbond 977 series Super I/O chips. 2. Enable keyboard interface.
09h	Reserved
0Ah	Disable PS/2 mouse interface (optional). Auto detect ports for keyboard & mouse followed by a port & interface swap (optional). Reset keyboard for Winbond 977 series Super I/O chips.
0Bh	Reserved
0Ch	Reserved
0Dh	Reserved
0Eh	Test F000h segment shadow to see whether it is R/W-able or not. If test fails, keep beeping the speaker.
0Fh	Reserved
10h	Auto detect flash type to load appropriate flash R/W codes into the run time area in F000 for ESCD & DMI support.
11h	Reserved
12h	Use walking 1's algorithm to check out interface in CMOS circuitry. Also set real-time clock power status, and then check for override.
13h	Reserved
14h	Program chipset default values into chipset. Chipset default values are MODBINable by OEM customers.
15h	Reeserved
16h	Initial Early_Init_Onboard_Generator switch.
17h	Reserved
18h	Detect CPU information including brand, SMI type (Cyrix or Intel) and CPU level (586 or 686).
19h	Reserved
1Ah	Reserved
1Bh	Initial interrupts vector table. If no special specified, all H/W interrupts are directed to SPURIOUS_INT_HDLR & S/W interrupts to SPURIOUS_soft_HDLR.
1Ch	Reserved
1Dh	Initial EARLY_PM_INIT switch.
1Eh	Reserved
1Fh	Load keyboard matrix (notebook platform)
20h	Reserved
21h	HPM initialization (notebook platform)
22h	Reserved
23h	1. Check validity of RTC value: e.g. a value of 5Ah is an invalid value for RTC minute. 2. Load CMOS settings into BIOS stack. If CMOS checksum fails, use default value instead. 3. Prepare BIOS resource map for PCI & PnP use. If ESCD is valid, take into consideration of the ESCD's legacy information. 4. Onboard clock generator initialization. Disable respective clock resource to empty PCI & DIMM slots. 5. Early PCI initialization: -Enumerate PCI bus number -Assign memory & I/O resource -Search for a valid VGA device & VGA BIOS, and put it into C000:0.

Code	Description
24h	Reserved
25h	Reserved
26h	Reserved
27h	Initialize INT 09 buffer
28h	Reserved
29h	Program CPU internal MTRR (P6 & PII) for 0-640K memory address. Initialize the APIC for Pentium class CPU. Program early chipset according to CMOS setup. Example: onboard IDE controller. Measure CPU speed. Invoke video BIOS.
2Ah	Reserved
2Bh	Reserved
2Ch	Reserved
2Dh	Initialize multi-language. Put information on screen display, including Award title, CPU type, CPU speed ….
2Eh	Reserved
2Fh	Reserved
30h	Reserved
31h	Reserved
32h	Reserved
33h	Reset keyboard except Winbond 977 series Super I/O chips.
34h	Reserved
35h	Reserved
36h	Reserved
37h	Reserved
38h	Reserved
39h	Reserved
3Ah	Reserved
3Bh	Reserved
3Ch	Test 8254
3Dh	Reserved
3Eh	Test 8259 interrupt mask bits for channel 1.
3Fh	Reserved
40h	Test 8259 interrupt mask bits for channel 2.
41h	Reserved
42h	Reserved
43h	Test 8259 functionality.
44h	Reserved
45h	Reserved
46h	Reserved
47h	Initialize EISA slot
48h	Reserved
49h	1. Calculate total memory by testing the last double word of each 64K page. 2. Program writes allocation for AMD K5 CPU.
4Ah	Reserved
4Bh	Reserved
4Ch	Reserved
4Dh	Reserved
4Eh	1. Program MTRR of M1 CPU 2. Initialize L2 cache for P6 class CPU & program CPU with proper cacheable range.

Code	Description
	3. Initialize the APIC for P6 class CPU. 4. On MP platform, adjust the cacheable range to smaller one in case the cacheable ranges between each CPU are not identical.
4Fh	Reserved
50h	Initialize USB
51h	Reserved
52h	Test all memory (clear all extended memory to 0)
53h	Reserved
54h	Reserved
55h	Display number of processors (multi-processor platform)
56h	Reserved
57h	1. Display PnP logo 2. Early ISA PnP initialization -Assign CSN to every ISA PnP device.
58h	Reserved
59h	Initialize the combined Trend Anti-Virus code.
5Ah	Reserved
5Bh	(Optional Feature) Show message for entering AWDFLASH.EXE from FDD (optional)
5Ch	Reserved
5Dh	1. Initialize Init_Onboard_Super_IO switch. 2. Initialize Init_Onbaord_AUDIO switch.
5Eh	Reserved
5Fh	Reserved
60h	Okay to enter Setup utility; i.e. not until this POST stage can users enter the CMOS setup utility.
61h	Reserved
62h	Reserved
63h	Reserved
64h	Reserved
65h	Initialize PS/2 Mouse
66h	Reserved
67h	Prepare memory size information for function call: INT 15h ax=E820h
68h	Reserved
69h	Turn on L2 cache
6Ah	Reserved
6Bh	Program chipset registers according to items described in Setup & Auto-configuration table.
6Ch	Reserved
6Dh	1. Assign resources to all ISA PnP devices. 2. Auto assign ports to onboard COM ports if the corresponding item in Setup is set to “AUTO”.
6Eh	Reserved
6Fh	1. Initialize floppy controller 2. Set up floppy related fields in 40:hardware.
70h	Reserved
71h	Reserved
72h	Reserved

Code	Description
73h	(Optional Feature) Enter AWDFLASH.EXE if : -AWDFLASH is found in floppy drive. -ALT+F2 is pressed
74h	Reserved
75h	Detect & install all IDE devices: HDD, LS120, ZIP, CDROM…..
76h	Reserved
77h	Detect serial ports & parallel ports.
78h	Reserved
79h	Reserved
7Ah	Detect & install co-processor
7Bh	Reserved
7Ch	Reserved
7Dh	Reserved
7Eh	Reserved
7Fh	1. Switch back to text mode if full screen logo is supported. -If errors occur, report errors & wait for keys -If no errors occur or F1 key is pressed to continue: ◆Clear EPA or customization logo.
80h	Reserved
81h	Reserved
82h	1. Call chipset power management hook. 2. Recover the text fond used by EPA logo (not for full screen logo) 3. If password is set, ask for password.
83h	Save all data in stack back to CMOS
84h	Initialize ISA PnP boot devices
85h	1. USB final Initialization 2. NET PC: Build SYSID structure 3. Switch screen back to text mode 4. Set up ACPI table at top of memory. 5. Invoke ISA adapter ROMs 6. Assign IRQs to PCI devices 7. Initialize APM 8. Clear noise of IRQs.
86h	Reserved
87h	Reserved
88h	Reserved
89h	Reserved
90h	Reserved
91h	Reserved
92h	Reserved
93h	Read HDD boot sector information for Trend Anti-Virus code
94h	1. Enable L2 cache 2. Program boot up speed 3. Chipset final initialization. 4. Power management final initialization 5. Clear screen & display summary table 6. Program K6 write allocation 7. Program P6 class write combining

Code	Description
95h	1. Program daylight saving 2. Update keyboard LED & typematic rate
96h	1. Build MP table 2. Build & update ESCD 3. Set CMOS century to 20h or 19h 4. Load CMOS time into DOS timer tick 5. Build MSIRQ routing table.
FFh	Boot attempt (INT 19h)

4-14 Flash BIOS Utility

Utilize AWARD Flash BIOS programming utility to update on-board BIOS for the future new BIOS version. Please contact your technical window to get this utility if necessary.

NOTE : Remark or delete any installed Memory Management Utility (such as HIMEM.SYS, EMM386.EXE, QEMM.EXE, …, etc.) in the CONFIG.SYS files before running Flash programming utility.