

Chapter 1

System Board

1.1 Features

This high-performance system board supports the Intel Pentium II CPU running at 233/266/300 MHz. Designed to work with Intel 440LX system controller, which consists of the PCI/AGP controller (PAC) and the PCI/ISA IDE accelerator (PIIX4), the CPU carries a new generation of power.

The PAC host bus interface supports up to two Pentium II processors with 66 MHz bus frequency. It also provides a 72-bit DRAM support using both extended data output (EDO) and synchronous DRAM (SDRAM) DIMMs. The PAC introduces a new technology, which is the Accelerated Graphics Port (AGP) interface. Supporting up to 133 MHz data transfer rate, the AGP interface boosts graphics performance.

The PIIX4 is a multifunction PCI device controller implementing system functions including PCI-to-PCI bridge, PCI IDE, universal serial bus (USB) host/hub, and enhance power management. It also supports Ultra DMA/33 synchronous DMA-compatible devices.

The system board utilizes both the ISA and the PCI local bus architecture. Two ISA and four PCI bus slots (including one PCI/ISA shared slot) reside on the board to allow installation of either master or slave devices.

Four memory banks composed of 168-pin dual inline memory module (DIMM) sockets support a maximum system memory of 512 MB using 128-MB DIMMs. The sockets support both EDO and SDRAM-type DIMMs.

A 50-pin Fast SCSI-II and a 68-pin Wide SCSI interface come with the system board to connect SCSI devices. Standard I/O features such as two enhanced IDE drive interfaces, two serial interfaces, one parallel port interface, a diskette drive interface, and PS/2 mouse and keyboard connectors reside on the system board.

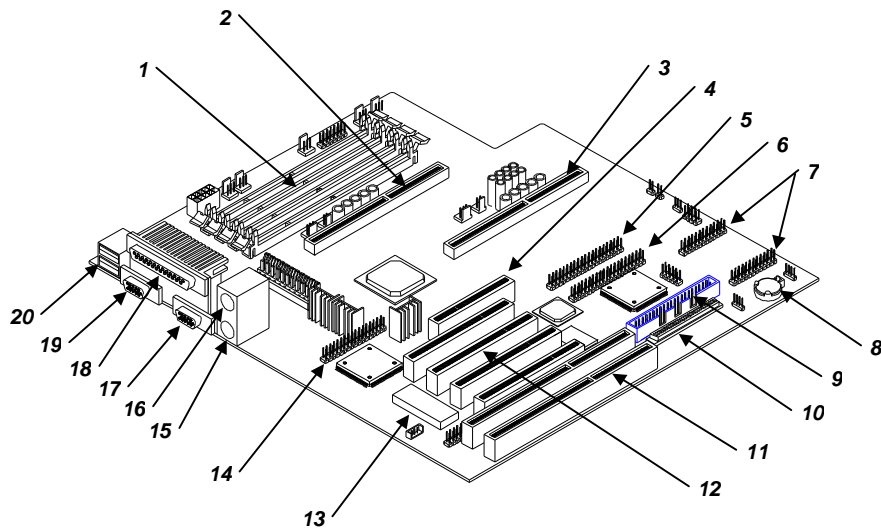
The system board supports two optional features, the ASM Pro and the remote diagnostic management (RDM), that allow better server management. The ASM Pro detects problems in CPU thermal condition, CPU working voltage detection ($\pm 12V/\pm 5V/3.3V/1.5V$), and PCI bus utilization calculation. It also detects if the CPU fan or the chassis fan malfunctions. The RDM allows execution of the RDM diagnostic program from a remote RDM station to fix detected problems or to reboot the system.

1.2 Major Components

The system board has the following major components:

- Exclusive slots for two Intel Pentium II processors
- Memory banks (Bank 0 to Bank 3) composed of four 168-pin DIMM sockets
- Two ISA and four PCI expansion slots (including one PCI/ISA shared slot)
- 256-KB Flash ROM for system BIOS
- 50-pin Fast SCSI-II and 68-pin Wide SCSI interfaces
- RDM connectors
- ASM controller chipset
- Enhanced IDE hard disk and diskette drive interfaces
- Power connector for 250-watt switching power supply
- System controller chipsets
- External ports:
 - USB connector
 - Parallel port
 - Serial port 1
 - Serial port 2
 - PS/2-compatible keyboard port
 - PS/2-compatible mouse port

1.2.1 System Board Layout



- | | |
|--|-----------------------------|
| 1 DIMM sockets | 11 ISA slots |
| 2 Pentium II CPU slot 1 | 12 PCI slots |
| 3 Pentium II CPU slot 2 | 13 BIOS |
| 4 Accelerated graphics port (AGP) interface slot | 14 Diskette drive connector |
| 5 Primary IDE connector | 15 PS/2 keyboard port |
| 6 Secondary IDE connector | 16 PS/2 mouse port |
| 7 RDM connectors | 17 Serial port 1 |
| 8 Battery | 18 Parallel port |
| 9 Narrow SCSI connector | 19 Serial port 2 |
| 10 Wide SCSI connector | 20 USB connector |

Figure 1-1 System Board Layout

1.3 Jumpers and Connectors

1.3.1 Jumper and Connector Locations

Figure 1-2 shows the jumper locations on the system board. The blackened pin on a jumper represents pin 1.

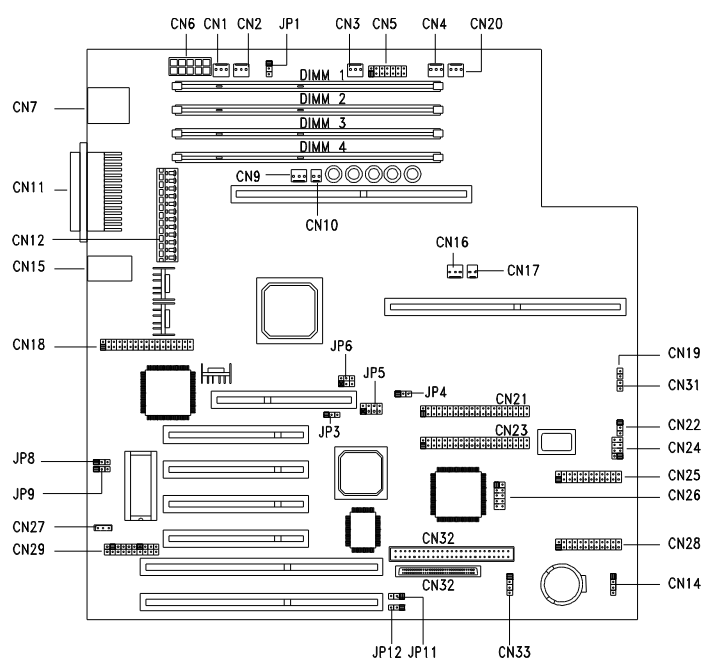


Figure 1-2 Jumper and Connector Locations



The blackened pin of a jumper or connector represents pin 1.

1.3.2 Jumper Settings

Table 1-1 Jumper Settings

Jumper	Setting	Function
S/W Power Down for 420W SPS JP1	1-2* 2-3	Enabled Disabled
ITP JP3, JP4	JP3 JP4 1-2, 1-2 2-3*, 1-2* 2-3, 2-3	CPU1 Dual CPU CPU 2
External Clock JP6	1-2, 4-5* 2-3, 5-6	66 MHz 60 MHz
BIOS JP8	1-2* 2-3	Acer OEM
Password Security JP9	1-2 2-3*	Check password Bypass password
Sound Output JP11	1-2* 2-3	Buzzer Speaker
SCSI Termination JP12	1-2* 2-3	Terminator set to ON SCSI terminator set to ON or OFF by software

* Default setting

Table 1-2 lists the CPU core over bus frequency ratios depending on JP3 settings.

Table 1-2 JP5 Settings for CPU Core/Bus Frequency Ratio

JP5 Settings				CPU Core / Bus Freq. Ratio
1-2	3-4	5-6	7-8	
Closed	Closed	Closed	Closed	2
Closed	Closed	Open	Closed	3
Closed	Closed	Closed	Open	4
Closed	Open	Closed	Closed	5/2
Closed	Open	Open	Closed	7/2
Open	Open	Open	Open	2/1
Closed	Open	Closed	Open	9/2
Closed	Closed	Open	Open	5

1.3.3 Connector Functions

Table 1-3 lists the different connectors on the system board and their respective functions.

Table 1-3 Connector Functions

Connector	Function
CN1	250W power control connector
CN2	420W power control connector
CN3	Housing fan connector 1
CN4	Housing fan connector 2
CN5	Backplane hard disk LED connector
CN6	10-pin power connector
CN7	USB connector
CN9	CPU1 fan connector
CN10	CPU1 thermal sensor connector
CN11	Upper: Parallel port Lower: Serial ports
CN12	250W power supply control connector
CN14	Hard disk LED connector
CN15	Upper: PS/2 keyboard connector Lower: PS/2 mouse connector
CN16	CPU 2 fan connector
CN17	CPU2 thermal sensor connector
CN18	Diskette drive connector
CN19	Power switch
CN20	Housing fan connector 3
CN21	Enhanced IDE 1 connector
CN22	Power LED connector
CN23	Enhanced IDE 2 connector
CN24	Reset connector

Table 1-3 Connector Functions (continued)

Connector	Function
CN25, CN28	RDM connectors
CN26	Redundant power status connector
CN27	Wake up ON LAN connector
CN29	Feature connector (for Intel SMM)
CN30	Narrow SCSI connector
CN32	Wide SCSI connector
CN33	Speaker connector
CN31	Housing door connector

1.4 ESD Precautions

Always observe the following ESD (electrostatic discharge) precautions before installing any system component:

1. Do not remove any system component from its packaging unless you are ready to install it.
2. Wear a wrist grounding strap before handling electronic components. Wrist grounding straps are available at most electronic component stores.



DO NOT attempt the procedures in the following sections unless you are confident of your capability to perform them. Otherwise, ask a service technician for assistance.

1.5 Installing the Processor Heat Sink and Fan

The Pentium II processor module comes with holes on one side to hold the clips of the heat sink and fan. The upper set of holes (near the latches) on the processor are wider and should match the wider ends of the clips on the heat sink. The lower set of holes are smaller and should match the narrow ends of the heat sink clips.

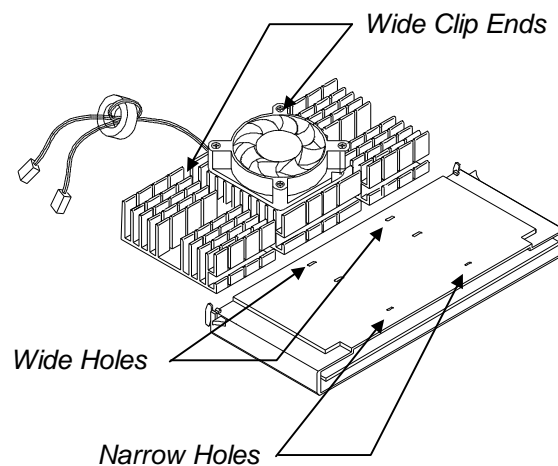


Figure 1-3 Matching the Fan-Heat Sink Clips with the Holes on the Processor

Follow these steps when installing the heat sink and fan to the Pentium II processor module:

1. Remove the thermal tape protector at the back of the heat sink.
2. Insert the wide clip ends to the wide holes on the processor and the narrow clip ends to the narrow holes.

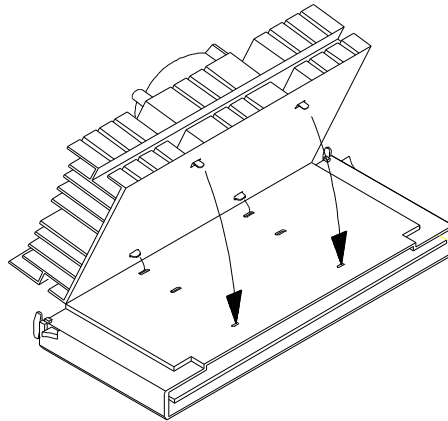


Figure 1-4 Inserting the Clip Ends to the Processor Holes

3. Use a screwdriver to press and lock in the wide end of a clip first. Then without lifting the screwdriver, point it downward to press and lock the narrow end of the clip. See Figures 5 and 6 for the illustration of this step.

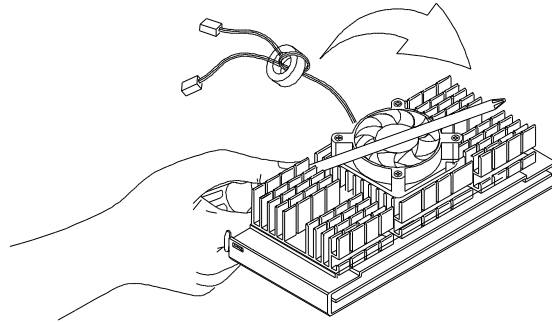


Figure 1-5 *Locking a Wide Clip End*

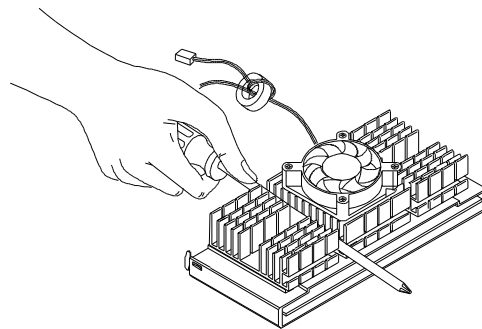


Figure 1-6 *Locking a Narrow Clip End*

4. Repeat step 3 to lock the other clip.

1.6 Installing a Pentium II Processor

Follow these steps to install the Pentium II processor to the socket on the CPU board.

1. Place the retention mechanism over the processor socket on the CPU board. Secure it with the screws that came with the package.

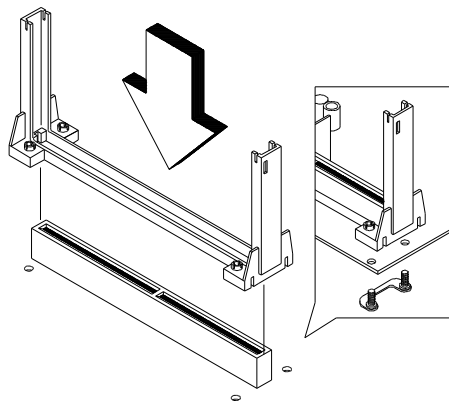


Figure 1-7 Installing the Pentium II Retention Mechanism

2. With the processor module golden fingers pointing downward, align the processor to the posts of the retention mechanism then lower it down. See Figure 2-10.



The golden fingers of the Pentium II module is slotted such that it only fits in one direction. Make sure that module groove matches the one on the processor socket.

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3. Press down the processor module until the golden fingers completely fit into the socket.

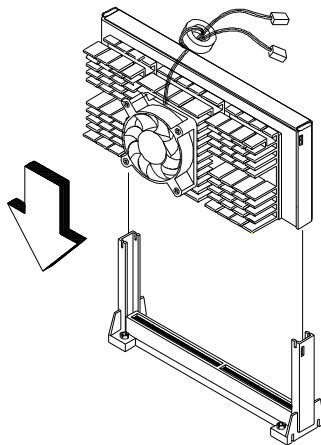


Figure 1-8 Installing a Pentium II Processor

4. Press the latches on the sides to lock the processor module into place.

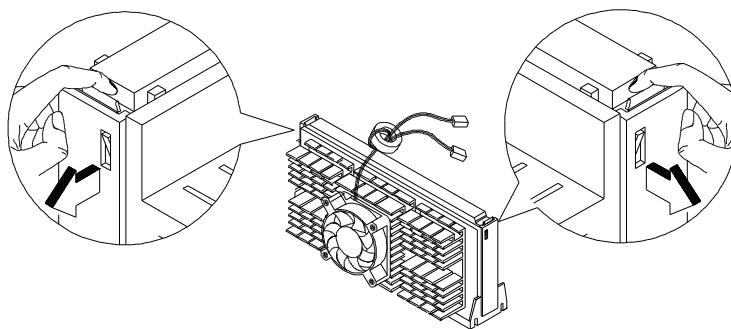


Figure 1-9 Securing the Pentium II Processor

1.7 Removing a Pentium II Processor

Follow these steps to remove the Pentium II CPU module from the slot.

1. Unlock the latches the secure that processor module.

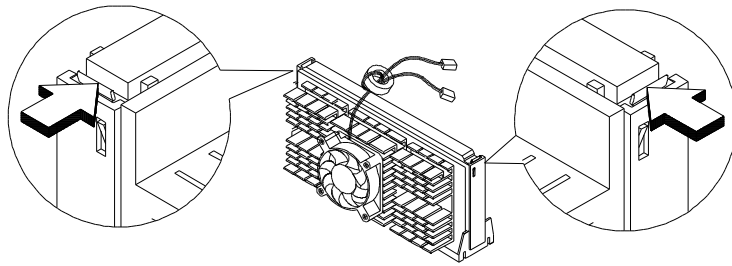


Figure 1-10 Unlocking the Module Latches

2. Firmly hold the processor module and pull it out of the socket.

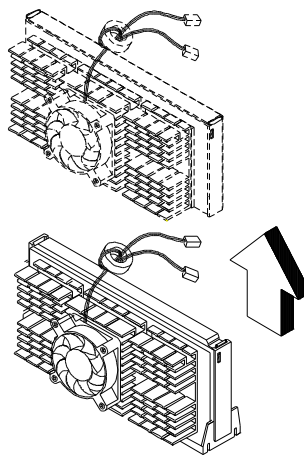


Figure 1-11 Removing the Pentium II Processor

1.8 Memory Upgrade

The four 168-pin sockets onboard support both extended data output (EDO) and SDRAM-type DIMMs. You may install 16-MB, 32-MB, 64-MB, or 128-MB DIMMs for a maximum of 512-MB system memory. Each of the sockets represents one independent bank. This allows you to install DIMMs with different capacities to form a configuration.

1.8.1 Memory Configurations

Table 1-4 lists some system memory configurations. You may combine DIMMs with various capacities to form other combinations.

Table 1-4 Memory Configurations

DIMM1	DIMM2	DIMM3	DIMM4	Total Memory
16 MB				16 MB
16 MB	16 MB			32 MB
16 MB	16 MB	16 MB		48 MB
16 MB	16 MB	16 MB	16 MB	64 MB
32 MB				32 MB
32 MB	32 MB			64 MB
32 MB	32 MB	32 MB		96 MB
32 MB	32 MB	32 MB	32 MB	128 MB
64 MB				64 MB
64 MB	64 MB			128 MB
64 MB	64 MB	64 MB		192 MB
64 MB	64 MB	64 MB	64 MB	256 MB
128 MB				128 MB
128 MB	128 MB			256 MB
128 MB	128 MB	128 MB		384 MB
128 MB	128 MB	128 MB	128 MB	512 MB

1.8.2 Installing a DIMM

To install a DIMM, align it with the socket and press it down until the holding clips secure the DIMM in place.



The DIMM socket is slotted to ensure proper installation. If you slip in a DIMM but does not completely fit, you may have inserted it the wrong way. Reverse the orientation of the DIMM.

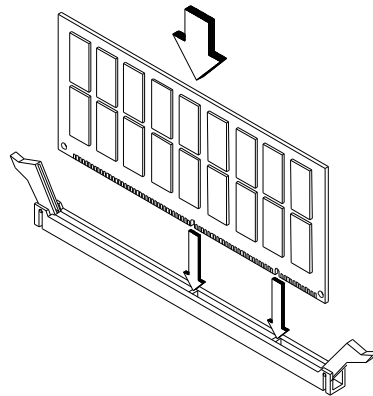


Figure 1-12 Installing a DIMM

1.8.3 Removing a DIMM

To remove a DIMM, press the holding clips on both sides of the socket outward to release the DIMM.



Place your forefingers on the top of the DIMM before you press the holding clips to gently disengage the DIMM from the socket.

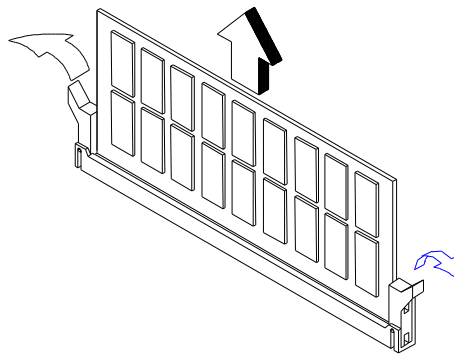


Figure 1-13 Removing a DIMM

1.8.4 Reconfiguring the System

Reconfigure the system after installing or removing DIMMs.

Follow these steps to reconfigure the system:

1. Reboot the system. A memory error message appears, indicating that the total memory does not match the value stored in CMOS.
2. Press **CTRL** + **ALT** + **ESC** during the power-on self-test (POST) routine to run Setup. During POST, a message indicating a wrong memory configuration appears.
3. Press **ESC** twice to exit Setup and reboot the system. The system boots with the new memory configuration.

1.9 VGA/LAN Combo Card (Optional)

The system board supports the VGA/LAN combo PCI card. This allows the system to support enhanced video and local area network capabilities through a single card.



The VGA/LAN combo card is an option and may not be present in all models.

1.9.1 Features

The combo card includes external video (CN3) and LAN (CN4) connectors.

The LAN controller chipset on the card supports the remote “wake-up on LAN” feature that allows application installation or data access from a remote system. It is compatible with IEEE 802.3/802.3u 10BASE-T and 100BASE-TX. It also allows back-to-back transmission at 100 Mbps.

The VGA controller chipset supports the ATI multimedia channel 2.0 to allow video capture through the video decoder and use of video phone, TV tuner applications, and MPEG decoder for hardware video.

1.9.2 Card Layout

Figure 1-14 shows the VGA/LAN combo card layout and jumper settings.

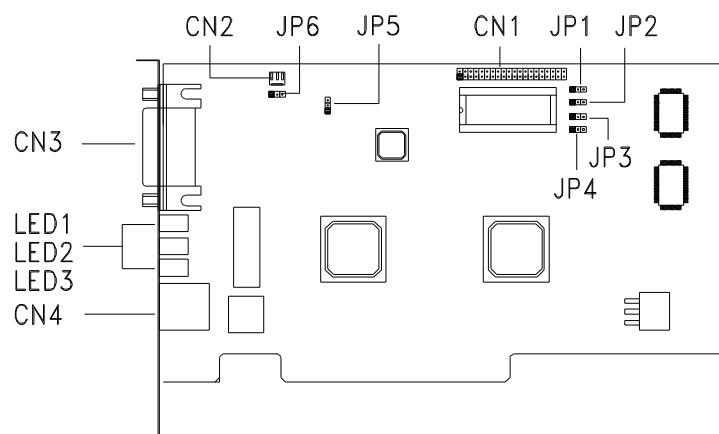


Figure 1-14 VGA/LAN Combo Card Layout

1.9.3 Jumper Settings

Table 1-5 VGA/LAN Combo Card Jumper Settings

Jumper	Setting	Function
ROM Remapping JP1	1-2 2-3*	Map top 8K to bottom 8K No remapping
Interrupt JP2	1-2 2-3*	Enabled Disabled
VGA Controller JP3	1-2 2-3*	Disabled Enabled
VGA Feature JP4	1-2 2-3*	Disabled Enabled
Wake-up on LAN JP5	1-2* 2-3	High active Low active
LAN Power JP6	1-2 2-3*	System 5V Standby 5V

* Default setting

Table 1-6 VGA/LAN Combo Card Connector Functions

Connector	Function
CN1	ATI Multimedia Connector
CN2	Wake-up on LAN connector

Table 1-7 VGA/LAN Combo Card LED Functions

LED	Function
LED1	Link Integrity LED. This LED turns ON to indicate that there is a good network connection at either 10 Mbps or 100 Mbps.
LED2	Activity LED. This LED turns ON to indicate ongoing transmission or receiving of data.
LED3	Speed LED. This LED turns ON at 100 Mbps and OFF at 10 Mbps.

1.9.4 Card Installation

Follow these steps to install the VGA/LAN combo card.

1. Remove a bracket cover opposite an empty PCI slot.
2. Position the card over the PCI slot, then insert the card golden fingers into the slot until the card fits in place.
3. Secure the card with a screw.
4. Connect the "wake-up on LAN" cable from CN27 on the system board to CN2 on the card.

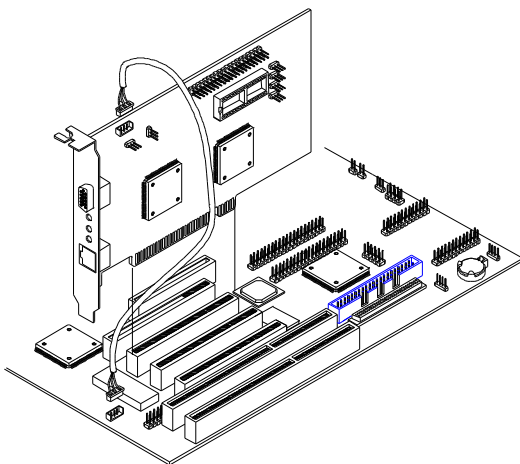


Figure 1-15 Installing the VGA/LAN Combo Card

1.10 SCSI Feature

The system board features a single-chip SCSI host adapter that adds SCSI I/O capability to the system. The chipset consists of an onboard microcontroller, bus master interface controller, and SCSI controllers. A 50-pin Fast SCSI-II interface with 10 MB/s transfer rate and a 68-pin Wide SCSI interface that transfers at 20 MB/s (Wide SCSI) and 40 MB/s (Ultra SCSI) are also onboard to accommodate various SCSI devices.

1.10.1 Using the SCSI Feature

Follow these steps to use the SCSI feature:

1. Install a SCSI device in the system and connect it to the SCSI interface on the system board. See Figure 1-1 for the location.
2. Enter the BIOS utility to set the corresponding SCSI parameters.
3. Enter the SCSI Configuration Utility and make the necessary changes. Refer to Chapter 3 for information on the SCSI Configuration Utility.

For more information about the installation procedures under different operating systems, read the README.XXX in the subdirectory of the target operating system.

1.11 Server Management Features

1.11.1 ASM Pro

The ASM Pro is a server management tool based on the Simple Network Management Protocol (SNMP). It detects server problems related to the CPU thermal condition, 5V/3.3V detection, or PCI bus utilization calculation.

This feature is designed primarily for server supervisors and management information system (MIS) personnel to help them detect errors or potential trouble spots in their network servers through a single management station.

The ASM Pro consists of two major parts:

- ASM-Station - a Windows-based monitoring station that communicates with the ASM-Agents.
- ASM-Agent(s) - the individual servers managed by the ASM-Station.

Refer to the ASM Pro user's manual for more information.

1.11.2 Remote Diagnostic Management

The Remote Diagnostic Management (RDM) is a network management tool that utilizes modems and telephone lines to control a host of servers from a remote station. It monitors and analyzes the server condition, updates the BIOS settings if necessary, or reboots the server in the event of failure and quickly return it to normal operation. This capability to execute the RDM program from a remote site bridges the distance barrier in fixing server problems and reduces wasted time due to system failure.

Installing the RDM Module

The system board comes with connectors CN25 and CN28 to accommodate the RDM module.

Follow these steps to install the RDM module and connect the cable:

1. See Figure 1-1 for the location of the RDM connectors.
2. Gently insert the RDM module into CN25 and CN28. The module fits only in one direction. Do not force it into the connectors.

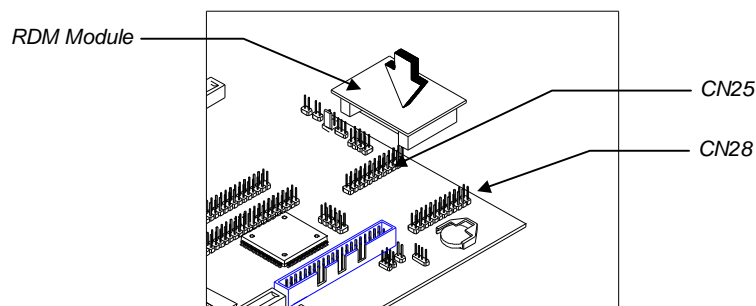


Figure 1-16 Installing the RDM Module

Refer to the RDM User's Guide for instructions on RDM installation.

1.12 Error Messages

Do not continue using the computer if you receive an error message of any type. Note the message and take corrective action. This section describes the types of error messages and lists their corresponding corrective measures.

There are two general types of error messages:

- Software
- System

1.12.1 Software Error Messages

Software error messages are returned by your operating system or application. These messages typically occur after you boot the operating system or when you run your application. If you receive this type of message, consult your application or operating system manual for help.

1.12.2 System Error Messages

A system error message indicates a problem with the computer itself. A message of this type normally appears during the power-on self-test, before the operating system prompt appears. Table 1-8 lists the system error messages.

Table 1-8 *System Error Messages*

Message	Action
CMOS Battery Error	Replace the battery or contact your dealer.
CMOS Checksum Error	Run Setup.
CPU BIOS Update Code Mismatch	Contact your dealer.
Diskette Drive Controller Error or Not Installed	Check and connect the control cable to the diskette controller.
Diskette Drive Error	Check the CMOS settings in Setup and the diskette drive cable connections.
Diskette Drive A Type Mismatch	Run Setup and select the proper drive type.
Diskette Drive B Type Mismatch	Run Setup and select the proper drive type.
Equipment Configuration Error	Modify DRAM configuration to agree with one of the options in Table 1-4.
Hard Disk Controller Error	Run Setup.
Hard Disk 0 Error	Check all cable connections. Replace hard disk.
Hard Disk 1 Error	Check all cable connections. Replace hard disk.
Hard Disk 0 Extended Type Error	Run Setup.
Hard Disk 1 Extended Type Error	Run Setup.
I/O Parity Error	Contact your dealer.
Keyboard Error or No Keyboard Connected	Check and connect the keyboard to the system unit.
Keyboard Interface Error	Replace the keyboard or contact your dealer.

Table 1-8 *System Error Messages (continued)*

Message	Action
Memory Error at: MMMM:SSSS:OOO (W:XXXX, R:YYYY) where: M: MB, S: Segment, O: Offset, X/Y: write/read pattern	Check DIMMs on the system board. Contact your dealer.
Memory Size Mismatch CPU Clock Mismatch	Check the memory size based on the system specifications. Check the internal cable connections. If you are sure that connections and values are correct, ignore the message. If the message reappears, ask for technical assistance.
Onboard Serial Port 1 Conflict	Run Setup and disable the port.
Onboard Serial Port 2 Conflict	Run Setup and disable the port.
Onboard Parallel Port Conflict	Run Setup and disable the port.
Pointing Device Error	Check and connect pointing device.
Pointing Device Interface Error	Replace the pointing device or contact your dealer.
Press F1 key to continue or Ctrl-Alt-Esc for Setup	Press F1 or CTRL + ALT + ESC to enter Setup.
Real Time Clock Error	Run Setup and set the time and date.
Press Esc to turn off NMI, any key to reboot	Press ESC to disregard the NMI error. Press any other key to reboot the system.
Real-time Clock Error	Run Setup.

1.12.3 Correcting Error Conditions

As a general rule, if an error message says "Press F1 to continue," it is caused by a configuration problem, which can be easily corrected. An equipment malfunction is more likely to cause a fatal error, i.e., an error that causes complete system failure.

Here are some corrective measures for error conditions:

1. Run Setup. You must know the correct configuration values for your system before you enter Setup, which is why you should write them down when the system is correctly configured. An incorrect configuration is a major cause of power-on error messages, especially for a new system.
2. Remove the system cover, following the directions in the housing installation manual. Check that the jumpers on the system board and any expansion boards are set correctly.
3. If you cannot access a new disk, it may be because your disk is not properly formatted. Format the disk first using the FDISK and FORMAT commands.
4. Check that all connectors and boards are secure.

If you go through these steps and still receive an error message, the cause may be an equipment malfunction.

If you are sure that your configuration values are correct and your battery is in good condition, the problem may lie in a damaged or defective chip.

In either case, contact an authorized service center for assistance.