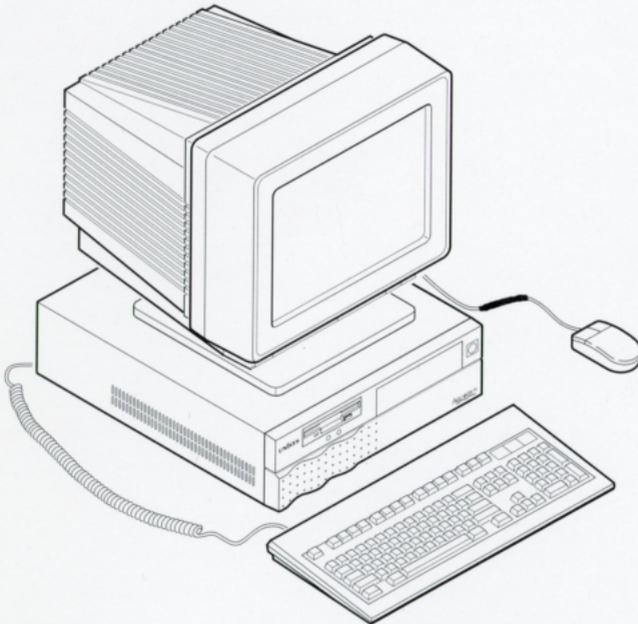


The New Wave in PCs & Servers

AQUANTA™

DL series 2 Upgrade and Configuration Guide



Aquanta DL series 2
CWP 50034
September 1997

UNISYS

The New Wave in PCs & Servers

AQUANTA™



DL series 2 Upgrade and Configuration Guide

Aquanta DL series 2
CWP 50034
September 1997

UNISYS

The New Wave in PCs & Servers
AQUANTA

The names, places, and/or events used in this publication are not intended to correspond to any individual, group, or association existing, living, or otherwise. Any similarity or likeness of the names, places, and/or events with the names of any individual, living or otherwise, or that of any group or association is purely coincidental and unintentional.

NO WARRANTIES OF ANY NATURE ARE EXTENDED BY THIS DOCUMENT. Any product or related information described herein is only furnished pursuant and subject to the terms and conditions of a duly executed agreement to purchase or lease equipment or to license software. The only warranties made by Unisys, if any, with respect to the products described in this document are set forth in such agreement. Unisys cannot accept any financial or other responsibility that may be the result of your use of the information in this document or software material, including direct, special, or consequential damages.

You should be very careful to ensure that the use of this information and/or software material complies with the laws, rules, and regulations of the jurisdictions with respect to which it is used.

This document is not a contract and does not create any representations or warranties by Unisys. All applicable representations, warranties and covenants are contained only in the applicable agreement signed by the parties. The information contained herein is subject to change without notice. Revisions may be issued to advise of such changes and/or additions.

RESTRICTED - Use, reproduction, or disclosure is restricted by DFARS 252.227-7013 and 252.211-7015/FAR 52.227-14 & 52.227-19 for commercial computer software.

FCC Statement

The statement below is included in this document to comply with a Federal Communications Commission (FCC) regulation. The FCC is an agency of the United States government; thus, the statement below applies to computing equipment installed in the United States of America. Unisys is taking appropriate steps to be in compliance with FCC regulations and similar regulations of other countries.

WARNING: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Subpart J of Part 15 of FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates and uses radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio and television reception. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/television technician for help.

Correspondence regarding this publication should be forwarded to Unisys Corporation either by addressing remarks to Multimedia Publishing, MS 18-007, Unisys Corporation, 2700 N. First Street, San Jose, CA 95134-2028 USA or by sending electronic mail to csgpi.sj@unisys.com

Contents

About This Guide

Who Should Use This Guide	ix
Organization	ix
Conventions	x
Related Product Information	xi

Section 1. Upgrading Your System

Preliminary Notes	1-2
Avoiding Electrostatic Discharge	1-3
Removing and Replacing the Workstation Cover	1-4
Removing and Replacing the Drive Assembly	1-6
Adding Drives	1-8
Installing a Drive in the 5.25-Inch Drive Bay	1-9
Installing a Hard Drive in the 3.5-Inch Drive Bay	1-10
Confirming the Success of the Drive Installation	1-12
Video Memory	1-13
Cache Memory	1-13
Adding Adapter Boards	1-13
Installing Adapter Boards	1-14
Upgrading System Memory	1-17
Planning Your DIMM Configuration	1-17
Removing a DIMM	1-18
Installing a DIMM	1-18
Confirming the Success of the DIMM Installation	1-20
Upgrading the CPU	1-20
Removing the Old CPU	1-21
Installing the New CPU	1-23
Confirming the Success of the CPU Installation	1-23
Connecting Peripherals to the Workstation	1-24
Where to Go From Here	1-24

Section 2. Configuring Your System

BIOS Setup Utility	2-1
Starting the BIOS Setup Utility	2-2
Changing the BIOS Settings	2-3
Exiting the BIOS Setup Utility	2-3
Preloaded Software	2-3
Installing Additional Software	2-4
Installing Application Software	2-4
Installing Hardware Device Drivers	2-4
Where to Go From Here	2-4

Section 3. Troubleshooting Your System

What to Do when a BIOS Password is Forgotten	3-2
Typical Startup Sequence	3-2
Solving Workstation Problems	3-4
Preliminary Checks	3-4
Troubleshooting an Installation Problem	3-5
Common Problems	3-7
Components You Can Replace	3-12
POST Beep Codes and Error Messages	3-13
POST Beep Codes	3-13
POST Messages	3-14

Appendix A. Specifications

Environmental Specifications	A-2
Operating Environment	A-2
Non-operating Environment	A-3
Shipping Specifications	A-3
Electrical Specifications	A-4
Memory Maps	A-5
Interrupts	A-7
System DMA Channels	A-8

Index

Figures

1-1.	Removing and Replacing the Workstation Cover	1-5
1-2.	Installing a Drive in the 5.25-Inch Drive Bay	1-7
1-3.	Installing a Hard Drive in the 3.5-Inch Drive Bay	1-11
1-4.	Sample System Configuration Screen	1-12
1-5.	Installing an Adapter Board	1-15
1-6.	Removing/Installing a DIMM	1-19
1-7.	Installing a CPU	1-22
1-8.	Workstation Back Panel	1-24
2-1.	BIOS Setup – Sample Main Menu	2-2

Tables

1-1.	Possible Drive Configurations	1-8
1-2.	Possible Adapter Board Configurations	1-13
3-1.	Common Problems and Solutions	3-7
3-2.	POST Messages	3-14
A-1.	Memory Map	A-5
A-2.	I/O Address Map	A-6
A-3.	Interrupt Assignments	A-7
A-4.	DMA Channels	A-8

About This Guide

The *Aquanta DL series 2 Upgrade and Configuration Guide* tells you how to upgrade the hardware, configure the software, and troubleshoot a CWP 50034 system. This guide also provides detailed technical specifications for your system.

Who Should Use This Guide

This guide assumes that you are a computer technician, network administrator, or power user. If you are a novice user, you should seek the help of a professional to perform the steps described in this guide.

Organization

This guide is organized as follows:

Section 1. Upgrading Your System

This section explains how to upgrade your system hardware, including adding more memory, feature boards, and hard disk drives.

Section 2. Configuring Your System

This section describes the BIOS Setup utility and how to change the BIOS settings after you've upgraded your hardware. It also discusses software driver and application issues.

Section 3. Troubleshooting Your System

This section describes troubleshooting methodology, common installation problems, and POST (Power On Self Test) beep codes and messages.

Appendix A. System Specifications

This appendix provides detailed specifications for your system, including electrical and environmental specifications, the memory map, I/O address map, system interrupt assignments, Direct Memory Access (DMA) channels, system board jumper settings, and IDE cable pin definitions.

Conventions

To simplify discussion, this guide uses the following conventions:

- The terms “workstation” and “system” are used interchangeably.
- “motherboard” and “system board” are used interchangeably.
- The term “connector” refers to the plug at either end of a cable. The term “receptacle” refers to plug-ins located on the body of a device. For example, the system unit includes a plug-in used to attach parallel devices; this plug-in is called a parallel receptacle.
- Keys that you press or characters that you enter are expressed in bold typeface. Here are some examples:

DELETE

Enter **O** in the field.

- To issue certain commands, you need to hold down one or more keys while you press another key. This type of key combination is expressed as follows:

SHIFT+ENTER

CTRL+ALT+DELETE

- This guide assumes you are using a PS/2™ -style keyboard. Keystrokes described apply to that keyboard-style only.

Related Product Information

Aquanta DL series 2 Quick Start

This large fold-out describes how to unpack, set up, and connect the system and its peripherals. It also provides a detailed drawing of the front and back panels of the system showing the locations of all the controls and receptacles.

Aquanta DL series 2 Configuration Label

This label provides a drawing of the motherboard, with special emphasis on the jumper locations. It also shows the CPU and jumper settings, as shipped from the factory.

Installation Documents

Installation documents are included for the various pieces of equipment (monitors, drives, and so forth) that shipped with the system.

Software Guides

Depending upon your order, software guides may be included with the system.

Section 1

Upgrading Your System

This section provides instructions on how to upgrade your system. The following topics are covered:

- Avoiding electrostatic discharge
- Removing and replacing the workstation cover
- Removing and replacing the drive assembly
- Adding drives
- Video memory
- Cache memory
- Adding adapter boards
- Upgrading system memory
- Upgrading the CPU
- Connecting peripherals to the workstation

Preliminary Notes

The following apply to all instructions included in this guide:

- When working on your workstation, place the unit on a stable, static-free surface.
- When screws are used to secure components, partially tighten all of the screws before completely tightening any one of them. This technique prevents misalignments and stripped screws.
- Your system has been designed as a modular assembly. Do not force, bend, or apply excessive physical force when adding components.
- Protect all connectors and wiring from breakage and from excessive wear and tear. Do not attempt to stretch the wiring over the metal edges of your system's frame.

Avoiding Electrostatic Discharge

All electronic assemblies contain static-sensitive components, and your system can be damaged by electrostatic discharge (ESD). The risk is greatest when the unit's cover is off, and when components are being removed or added. To minimize this risk, take the following precautions.

Caution

- Avoid producing friction static, which occurs most often when walking on new or newly cleaned rugs, or on any rug in a low humidity environment.
- While working on the system, wear an antistatic bracelet.
- Keep static-sensitive components (such as processor chips, video memory chips) in their packages until you are ready to install them.
- Before removing a component from its package, sit down and hold the package in one hand and touch the metal frame of your unit (a ground) with the other. Then, take the component out and install it immediately.
- Handle components by their edges. Avoid touching their leads, connectors, or contact points.
- If you need to remove a component from the system, immediately store it in antistatic packaging.

Removing and Replacing the Workstation Cover

To remove the workstation cover, complete the following steps:

1. Turn the system off. Disconnect the power cord and all peripherals.
2. Place the workstation, with the back panel facing you, on a stable, static-free work surface.
3. Remove the three screws that secure the cover to the back panel, as shown in Figure 1-1.
4. Slide the cover back, then up and off the chassis.

WARNING

Do not run the workstation with the cover off. Operating without a cover is a safety hazard to you.

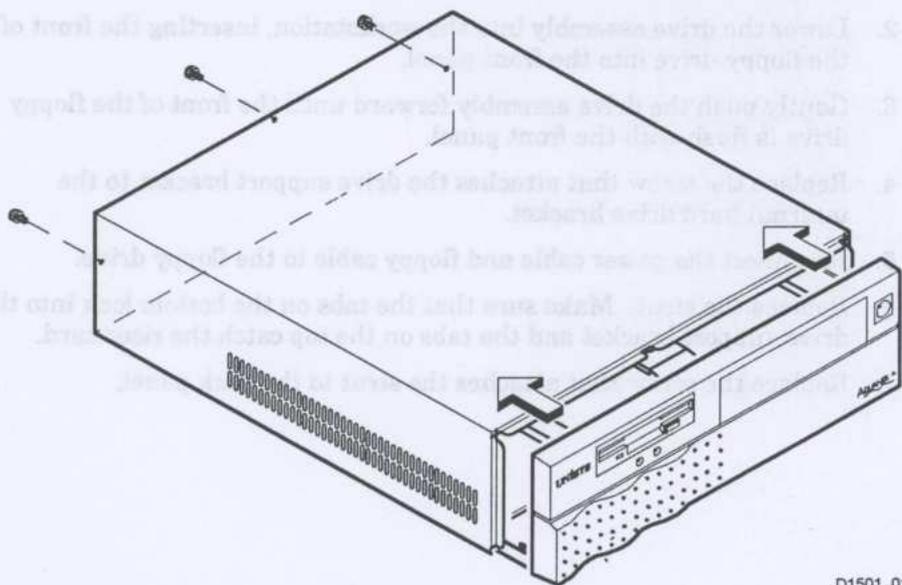
Caution

Do not run the workstation with the cover off. The workstation may short circuit or overheat.

To replace the workstation cover, complete the following steps:

1. Make sure that your system is turned off, and that the power cord and all peripherals are unplugged.
2. Make sure that your workstation is on a stable, static-free work surface, with the back panel facing you.
3. Slowly lower the cover while pressing in on both side panels, and ensure that the three tabs on the bottom of each side panel engage the edges on the bottom of the chassis.
4. Rest the front top edge of the cover on the shiny edge of the front panel, push in on the front edges of the side panels and slide the cover forward until the tabs on both the top and sides snap into place and all parts are flush.
5. Replace the three screws on the back panel.
6. Reconnect the power cord and all peripherals.

Figure 1-1. Removing and Replacing the Workstation Cover



D1501_01

Removing and Replacing the Drive Assembly

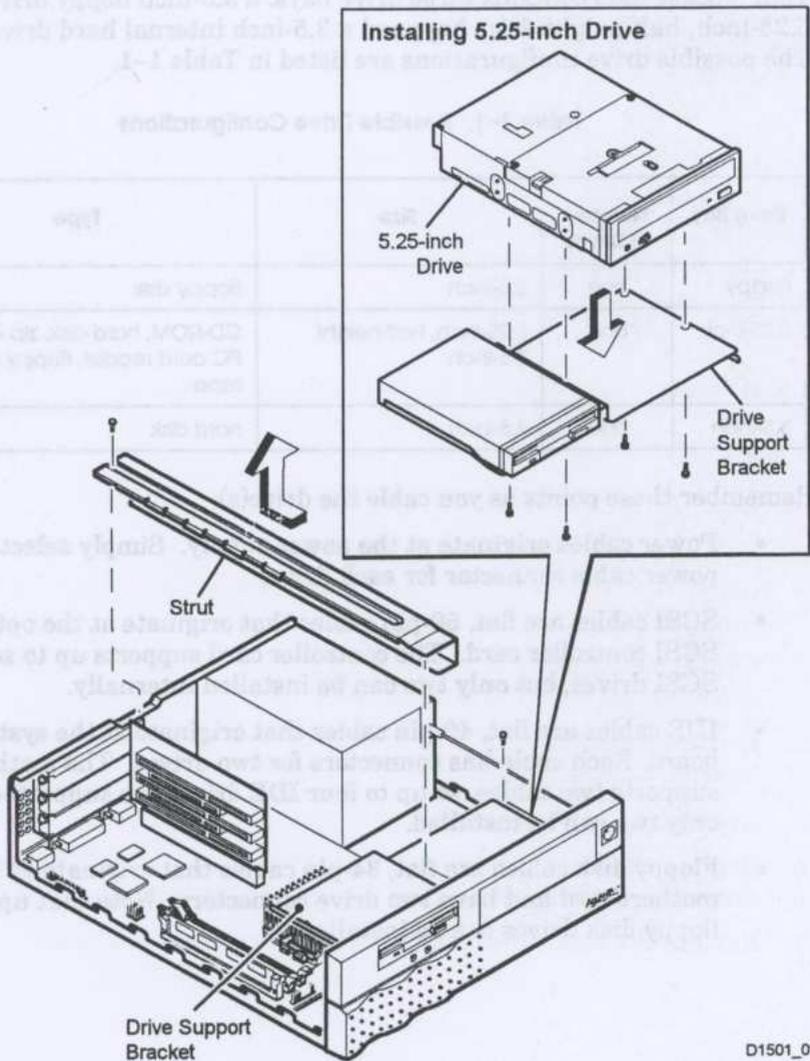
To remove the drive assembly, complete the following steps:

1. Remove the workstation cover, as described earlier.
2. Remove the screw that attaches the strut to the back panel. See Figure 1-2.
3. Slide the strut back and up, as shown in Figure 1-2.
4. Remove the screw that attaches the drive support bracket to the internal hard drive bracket. This screw is located on top, in the right rear corner of the drive support bracket.
5. Remove the power cable and the floppy cable from the back of the floppy drive.
6. Gently pull the floppy drive and the entire drive support bracket (shown in Figure 1-2) back and out of the workstation. Set it aside on a static-free surface.

To replace the drive assembly, complete the following steps:

1. Make sure that your system is turned off.
2. Lower the drive assembly into the workstation, inserting the front of the floppy drive into the front panel.
3. Gently push the drive assembly forward until the front of the floppy drive is flush with the front panel.
4. Replace the screw that attaches the drive support bracket to the internal hard drive bracket.
5. Reconnect the power cable and floppy cable to the floppy drive.
6. Replace the strut. Make sure that the tabs on the bottom lock into the drive support bracket and the tabs on the top catch the riser card.
7. Replace the screw that attaches the strut to the back panel.

Figure 1-2. Installing a Drive in the 5.25-Inch Drive Bay



D1501_02

Adding Drives

Your workstation contains three drive bays: a 3.5-inch floppy drive bay; a 5.25-inch, half-height drive bay; and a 3.5-inch internal hard drive bay. The possible drive configurations are listed in Table 1-1.

Table 1-1. Possible Drive Configurations

Drive Bay	Number of Drives	Size	Type
floppy	one	3.5-inch	floppy disk
5.25-inch	one	5.25-inch, half-height 3.5-inch	CD-ROM, hard disk, zip drive, PC card reader, floppy disk, or tape
3.5-inch	one	3.5-inch	hard disk

Remember these points as you cable the drive(s):

- Power cables originate at the power supply. Simply select a free power cable connector for each drive.
- SCSI cables are flat, 50-pin cables that originate at the optional SCSI controller card. The controller card supports up to seven SCSI drives, but only two can be installed internally.
- IDE cables are flat, 40-pin cables that originate at the system board. Each cable has connectors for two drives. The motherboard supports two cables, so up to four IDE drives are supported, but only two can be installed.
- Floppy disk cables are flat, 34-pin cables that originate at the motherboard and have two drive connectors. Note that up to two floppy disk drives can be installed.

Installing a Drive in the 5.25-Inch Drive Bay

To install any of the supported drives in the 5.25-inch drive bay, complete the following steps.

1. Turn off the system. Disconnect the power cord and all peripherals.
2. Remove the workstation cover, as described earlier in this section.

Caution

Protect your system from ESD, as described in "Avoiding Electrostatic Discharge," earlier in this section.

3. Remove the drive assembly, as described earlier in this section.
4. Remove the plastic drive bay cover from the front panel, unless you are installing an internal hard drive in this bay.
5. Open the drive carton and remove the drive and the screws that came with it.
6. Attach the drive to the drive support bracket with four screws, as shown in Figure 1-2.
7. Replace the drive assembly, as described earlier in this section. Make sure that the front of the drive is flush with the front panel, unless you are installing an internal hard drive in this bay.
8. Connect the appropriate power cable and interface cable to the rear of the drive.
9. Refer to the manufacturer's instructions to determine jumper settings, master/slave issues, and other specifics.
10. Replace the workstation cover, as described earlier in this section.
11. Go to "Confirming the Success of the Drive Installation," later in this section.

Installing a Hard Drive in the 3.5-Inch Drive Bay

To install a drive in the 3.5-inch drive bay, complete the following steps:

1. Turn off the system. Disconnect the power cord and all peripherals.
2. Remove the workstation cover, as described earlier in this section.

Caution

Protect your system from ESD, as described in "Avoiding Electrostatic Discharge, earlier in this section.

3. Remove the drive assembly, as described earlier in this section.
4. Remove the internal hard drive bracket (shown in Figure 1–3) by sliding it back and up.
5. Open the drive carton, and remove the drive and screws.
6. Insert the 3.5-inch drive into the internal hard drive bracket, as shown in Figure 1–3, and secure the drive with four screws.

Caution

Drive boards contain sensitive components that can be damaged if bumped against the chassis.

7. Replace the internal hard drive bracket by resting it on the bottom of the chassis, and sliding it forward. Make sure all the tabs hook properly.
8. Replace the drive assembly, as described earlier in this section.
9. Connect a power cable and interface cable to the newly installed drive.
10. Refer to the manufacturer's instructions to determine jumper settings, master/slave issues, and other specifics.
11. Replace the workstation cover, as described earlier in this section.

12. Go to "Confirming the Success of the Drive Installation," immediately following this section.

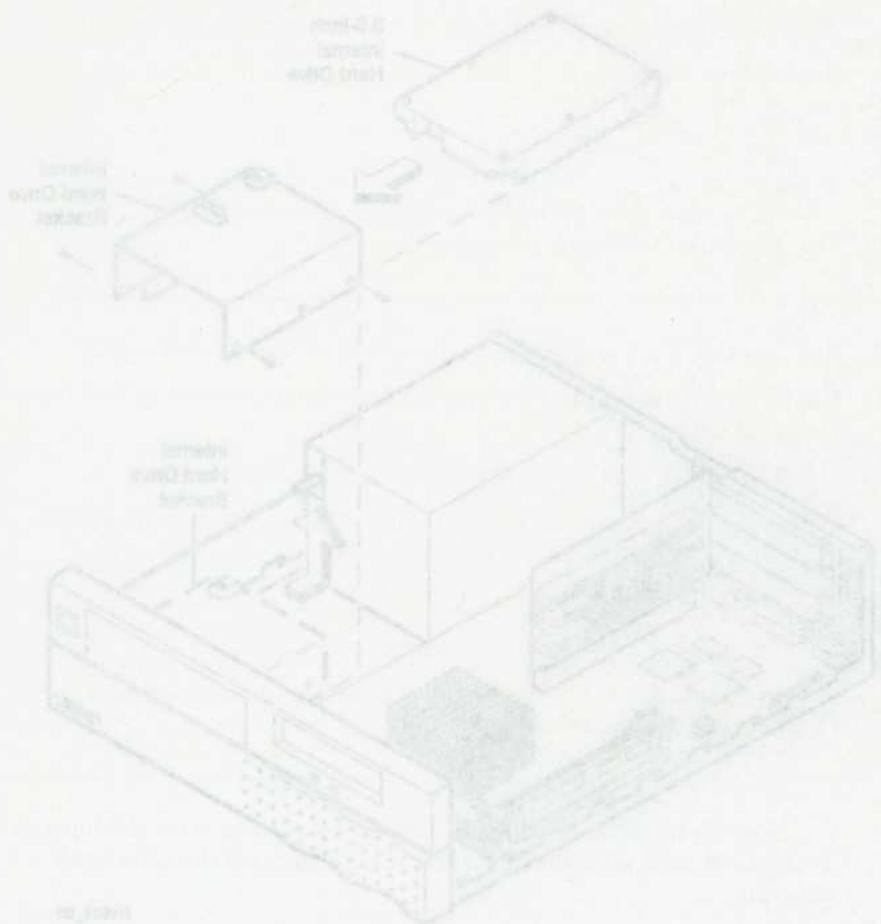
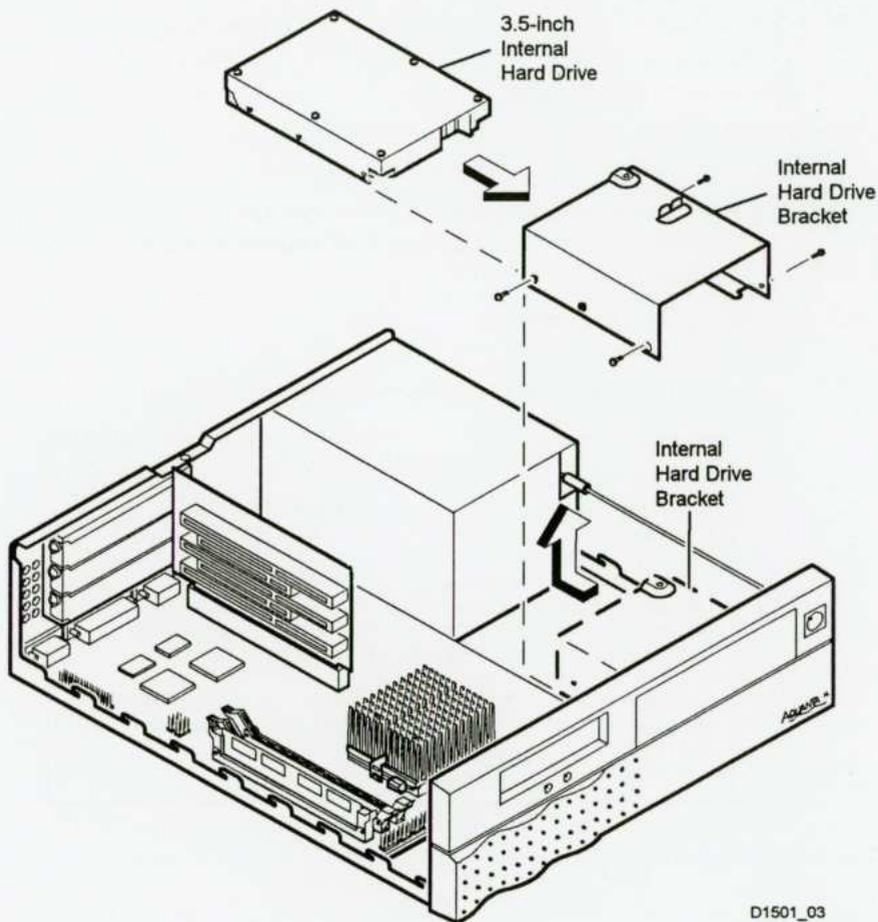


Figure 1-3. Installing a Hard Drive in the 3.5-Inch Drive Bay



Confirming the Success of the Drive Installation

1. Reconnect the power, and turn on the system.
2. The Aquanta Unisys logo screen appears, then the system configuration screen appears. A sample of this screen is shown in Figure 1-4. Press **Pause**.
3. Confirm that the drive configuration displayed on the system configuration screen matches what you have installed.

Note: *If the drive configuration does not match what you have installed, refer to Section 3, "Troubleshooting an Installation Problem."*

4. Press any key to continue.

Figure 1-4. Sample System Configuration Screen

PhoenixBIOS Setup Utility			
CPU Type:	Pentium	System ROM :	F255-FFFF
CPU Speed:	200 Mhz	BIOS Date :	07/14/97
System Memory :	640 KB	COM Ports :	None
Extended Memory :	31744 KB	LPT Ports :	0378
Shadow RAM :	384 KB	Display Type:	EGA/VGA
Cache RAM :	512 KB	PS/2 Mouse :	Installed
Hard Disk 0 :	853 MB	Diskette A :	1.44/1.25 Mb 3 1/2"
Hard Disk 1 :	None	Diskette B :	Disabled
Hard Disk 2 :	None		
Hard Disk 3 :	None		

D1501_04

Video Memory

Your system comes with an S3 Trio64V2/GX 64-bit PCI video controller built into the motherboard. The video memory has 2MB of SGRAM by default, and it cannot be upgraded.

Cache Memory

Your system is equipped with 512KB of pipeline burst, synchronous, second level cache memory. The second level cache memory cannot be upgraded.

Adding Adapter Boards

Your system provides a total of three expansion slots on the riser card. The supported adapter boards are described in Table 1-2.

Table 1-2. Possible Adapter Board Configurations

Slot	Type	Maximum Length
top	ISA	two-thirds length
middle	ISA or PCI	full length
bottom	ISA or PCI	one-half length

Consider the following when installing adapter boards:

- Adapter boards may have switches and jumpers that need to be set before installation. Refer to the board manufacturer's instructions for switch settings and jumper assignments.
- Address and interrupt assignments must be unique for each ISA adapter board. Use the BIOS Setup utility, described in Section 2 of this manual, to resolve any conflicts.

Installing Adapter Boards

To install an adapter board, complete the following steps:

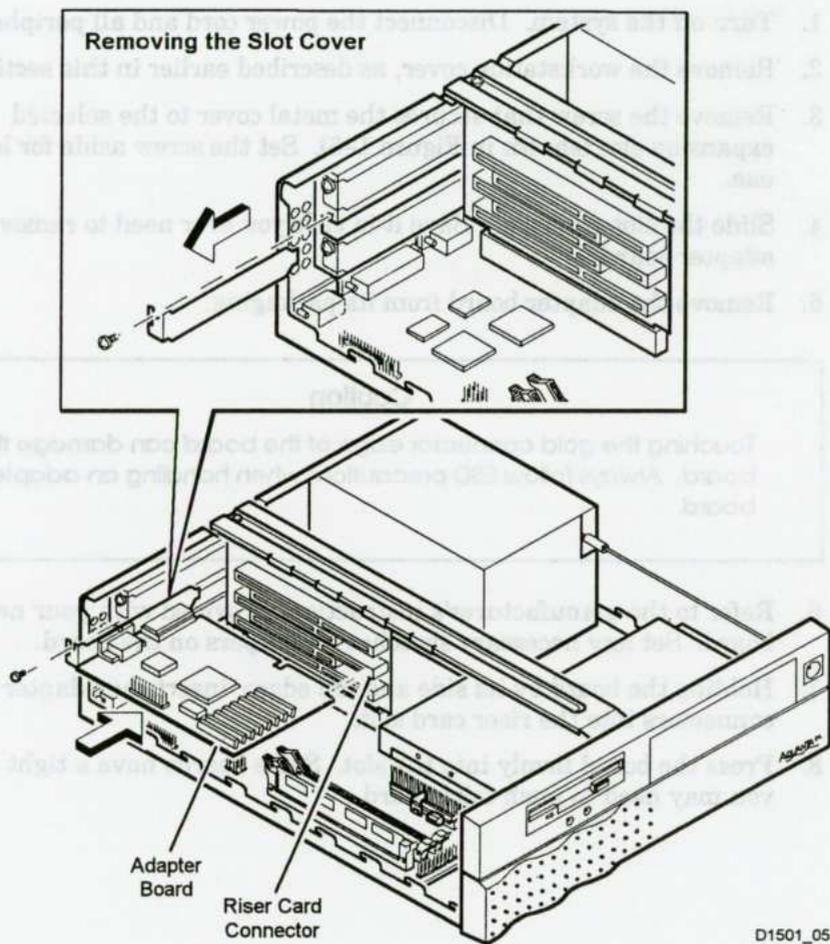
1. Turn off the system. Disconnect the power cord and all peripherals.
2. Remove the workstation cover, as described earlier in this section.
3. Remove the screw that secures the metal cover to the selected expansion slot (shown in Figure 1-5). Set the screw aside for later use.
4. Slide the slot cover out. Save it in case you ever need to remove the adapter board.
5. Remove the adapter board from its packaging.

Caution

Touching the gold connector edge of the board can damage the board. Always follow ESD precautions when handling an adapter board.

6. Refer to the manufacturer's instructions provided with your new board. Set any necessary switches or jumpers on the board.
7. Holding the board by its side and top edges, insert the adapter board connectors into the riser card slot.
8. Press the board firmly into the slot. Some boards have a tight fit, so you may need to push fairly hard.

Figure 1-5. Installing an Adapter Board



- Secure the adapter board to the chassis using the screw removed in step 3.

Caution

If you drop the screw into the workstation, be sure to retrieve it before continuing. A loose screw can damage your equipment by causing a short.

- Repeat steps 3 through 9 for any additional adapter boards. When all boards are installed, proceed to step 11.

Caution

Do not run your system without either an adapter board or slot cover in each of the expansion slots. If you operate the system without these items in place, your workstation can generate electromagnetic interference.

- Replace the workstation cover, as described earlier in this section.

Upgrading System Memory

You can upgrade the system memory by adding extra DIMMs or by replacing the factory-installed DIMMs with higher-capacity DIMMs.

Your workstation supports 8MB, 16MB, 32MB, 64MB, and 128MB DIMMs. These DIMMs must be 168-pin, gold-plated, non-parity (64 bit), 3.3V, unbuffered DIMMs.

DIMMs are installed in sockets. Each socket constitutes one bank. Your system supports three banks.

Your maximum DIMM configuration is 384MB, with a 128MB DIMM in each socket. Your minimum DIMM configuration is 8MB, with an 8MB DIMM in Bank 1, and Banks 2 and 3 empty.

Caution

Since the DIMM sockets on your motherboard are gold-plated, use only gold-plated DIMMs when upgrading your system memory. If you use tin-plated DIMMs, your system may become unstable.

Planning Your DIMM Configuration

To plan your DIMM configuration, keep the following in mind:

- Follow the 1 to 3 rule - When populating the DIMM sockets, first populate Bank 1, then Bank 2, and finally Bank 3.
- Follow the big to small rule - If using DIMMs of different memory capacities, put the largest memory DIMM in Bank 1, the next largest in Bank 2, and the smallest in Bank 3.

For example, you could put a 128MB DIMM in Bank 1, a 64MB DIMM in Bank 2, and a 16MB DIMM in Bank 3.

Removing a DIMM

If the memory configuration you want to install requires the removal of a previously installed DIMM, complete the following steps:

1. Remove the workstation cover, as described earlier in this section.
2. Locate the DIMM sockets (shown in Figure 1-6 as Banks 1, 2, and 3.)

Caution

Follow the precautions described in "Avoiding Electrostatic Discharge," earlier in this section.

3. Push down on one of the plastic retaining latches, then push down on the other latch. The DIMM will pop out of its socket.

Installing a DIMM

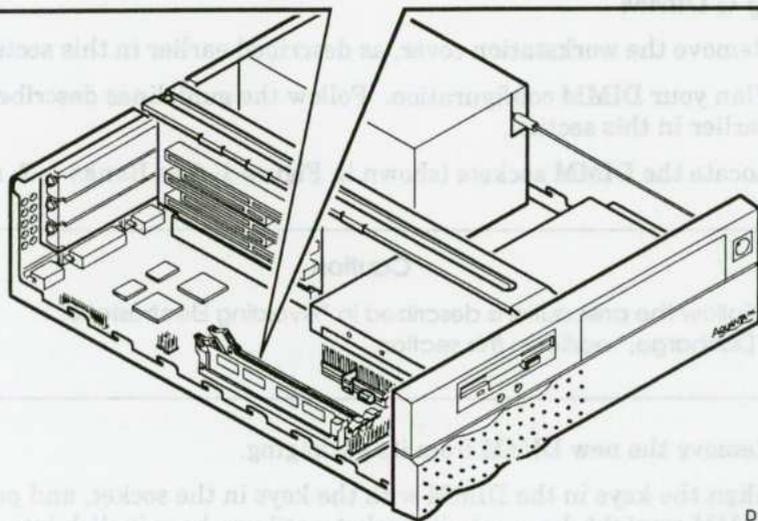
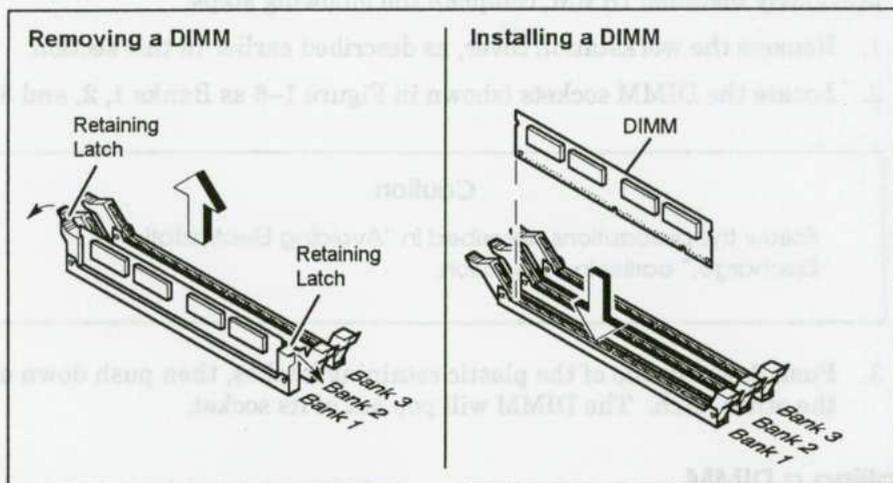
1. Remove the workstation cover, as described earlier in this section.
2. Plan your DIMM configuration. Follow the guidelines described earlier in this section.
3. Locate the DIMM sockets (shown in Figure 1-6 as Banks 1, 2, and 3.)

Caution

Follow the precautions described in "Avoiding Electrostatic Discharge," earlier in this section.

4. Remove the new DIMM from its packaging.
5. Align the keys in the DIMM with the keys in the socket, and push the DIMM straight down into its socket until you hear it click into place.
6. Replace the workstation cover, as described earlier in this section.
7. Go to "Confirming the Success of the DIMM Installation", later in this section.

Figure 1-6. Removing/Installing a DIMM



D1501_06

Confirming the Success of the DIMM Installation

1. Reconnect the power, and turn on the system.
2. The Aquanta Unisys logo screen appears, then the system configuration screen appears. A sample of this screen is shown in Figure 1-4. Press **Pause**.
3. Confirm that the DIMM configuration displayed on the system configuration screen matches what you have installed.

Note: *If the DIMM configuration does not match what you have installed, refer to Section 3, "Troubleshooting an Installation Problem."*

4. Press any key to continue.

Upgrading the CPU

Your system supports a Pentium P54C CPU operating at 133, 166, or 200 MHz; or a Pentium P54C CPU operating at 166, 200, or 233 MHz. When you ordered your system, you specified the speed and type of your CPU. If you want to upgrade to a faster CPU, contact your Unisys Sales Representative.

To upgrade your CPU, complete the following steps.

Removing the Old CPU

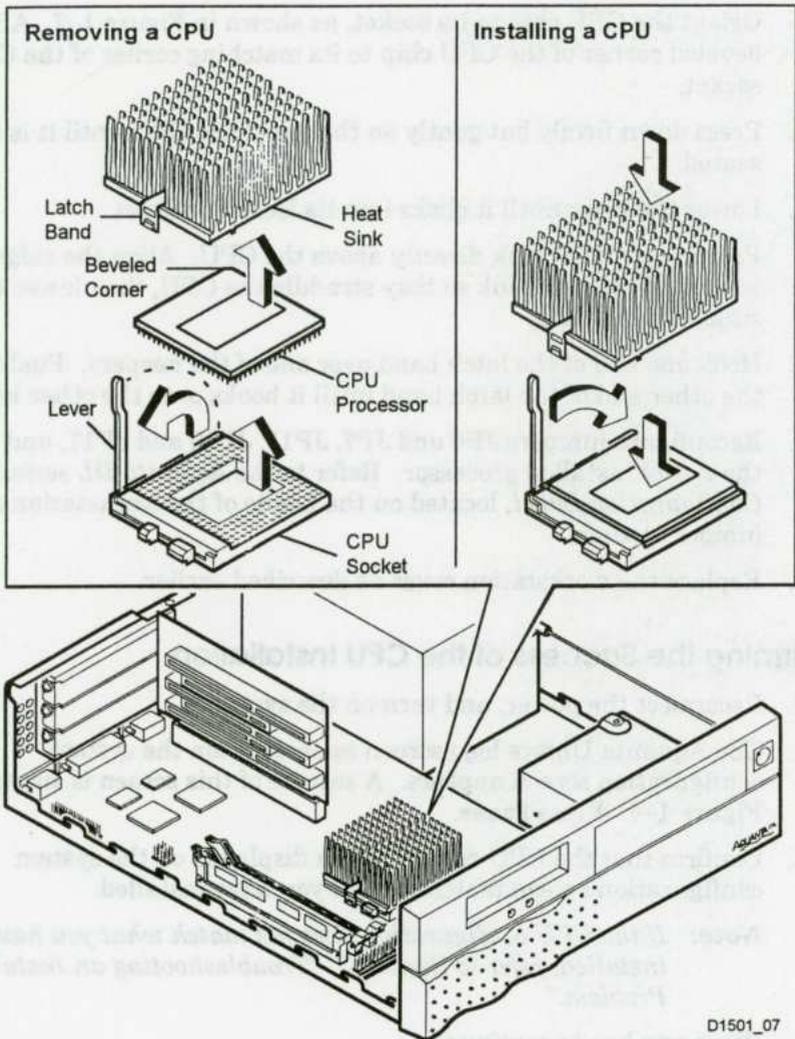
1. Turn the system off. Disconnect the power cord and all peripherals.
2. Remove the workstation cover, as described earlier.

Caution

Protect your system from ESD, as described in "Avoiding Electrostatic Discharge," earlier in this section.

3. Remove the drive assembly, as described earlier.
4. Locate the heat sink assembly on the motherboard (see Figure 1-7).
5. Press and hold down one end of the latch band, then pry the latch until it clears its keeper.
6. Press down and out on the other end of the latch band until it clears its keeper.
7. Lift the heat sink off the CPU.
8. Push the end of the socket lever away from the side of the CPU until the lever clears its keeper, then lift the lever.
9. Remove the CPU from the socket.
10. Wrap the CPU in antistatic material and store in a cool, dry place, in case you need it later.

Figure 1-7. Installing a CPU



D1501_07

Installing the New CPU

1. Remove the new CPU chip from its packaging.
2. Orient the CPU chip to its socket, as shown in Figure 1-7. Align the beveled corner of the CPU chip to its matching corner of the CPU socket.
3. Press down firmly but gently on the top of the CPU until it is fully seated.
4. Lower the lever until it clicks into its locked position.
5. Position the heat sink directly above the CPU. Align the ridges on the bottom of the heat sink so they straddle the CPU, then lower the heat sink onto the CPU.
6. Hook one end of the latch band over one of the keepers. Push down on the other end of the latch band until it hooks onto the other keeper.
7. Reconfigure jumpers JP6 and JP7, JP11, JP10 and JP17, and JP16 for the newly installed processor. Refer to the *Aquanta DL series 2 Configuration Label*, located on the inside of the workstation cover, for jumper settings.
8. Replace the workstation cover as described earlier.

Confirming the Success of the CPU Installation

1. Reconnect the power, and turn on the system.
2. The Aquanta Unisys logo screen appears, then the system configuration screen appears. A sample of this screen is shown in Figure 1-4. Press **Pause**.
3. Confirm that the CPU configuration displayed on the system configuration screen matches what you have installed.

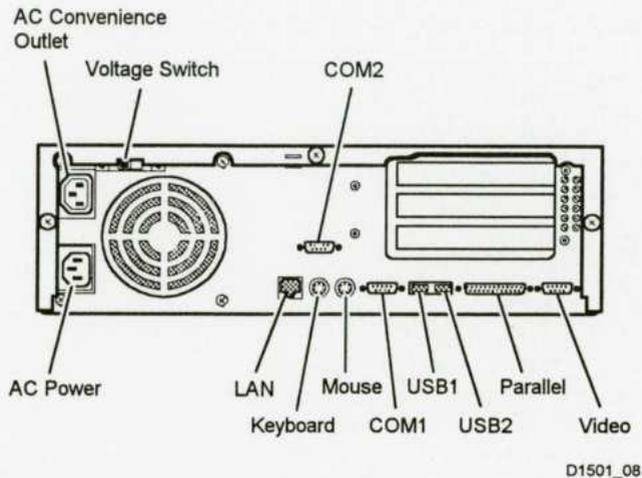
Note: *If the CPU configuration does not match what you have installed, refer to Section 3, "Troubleshooting an Installation Problem."*

4. Press any key to continue.

Connecting Peripherals to the Workstation

The peripherals for your workstation are all connected at the back panel of the workstation. Figure 1-8 shows the back panel of your workstation and the locations of the peripheral receptacles.

Figure 1-8. Workstation Back Panel



Where to Go From Here

If you encounter any problems after upgrading the hardware, see Section 3 for information on troubleshooting.

Section 2

Configuring Your System

This section discusses the BIOS Setup utility, your preloaded software, and how to install additional software.

BIOS Setup Utility

The BIOS Setup utility is a menu-driven program. Use it to define system parameters and allocate system resources. It is stored in nonvolatile memory and is a permanent part of your system. The BIOS Setup utility parameters and resources relate exclusively to system board functions.

Prior to shipment, the factory uses the BIOS Setup utility to define your system parameters. If you want to assign a system password or reset the system time, you will need to use the BIOS Setup utility before operating your system.

Starting the BIOS Setup Utility

To start the BIOS Setup utility:

1. Turn on your system.
2. When the Aquanta logo screen appears, press **F2**. The BIOS Setup main menu appears. A sample of this menu is shown in Figure 2-1.

Figure 2-1. BIOS Setup – Sample Main Menu

PhoenixBIOS Setup - Copyright 1985-95 Phoenix Technologies Ltd.

Main		Advanced	Security	Power	Boot	Exit	
		Item Specific Help					
	System Time:	[hh:mm:ss]				<Tab>, <Shift-Tab>, or <Enter> selects fields.	
	System Date:	[mm/dd/yyyy]					
	Diskette A:	[1.44 MB, 3 1/2"]					
	Diskette B:	[Not Installed]					
	▶ IDE Adapter 0 Master	(None)					
	▶ IDE Adapter 0 Slave	(None)					
	▶ IDE Adapter 1 Master	(None)					
	▶ IDE Adapter 1 Slave	(None)					
	Video System:	[EGA/VGA]					
	▶ Memory Cache						
	▶ Memory Shadow						
	▶ Boot Options						
	Numlock:	[On]					
	System Memory:	640 KB					
	Extended Memory:	31 MB					
F1 Help	↑ ↓	Select Item		- / + Change Values		F9 Setup Defaults	
ESC Exit	← →	Select Menu		Enter Select ▶ Sub-Menu		F10 Previous Values	

D1502_01

Changing the BIOS Settings

1. Press the right or left arrow key to highlight the name of the menu you want to activate. When you highlight a menu name, its parameters appear on the screen.
2. Press the up or down arrow key to highlight the parameter you want to change.
3. Press the plus or minus key to change the value of the parameter.

Note: A black triangle next to an entry indicates that a submenu is available to further define that parameter.

4. Press **Enter** to select a submenu parameter.
5. Press **Esc** to return to the previous menu.

Note: Item specific help appears on the right side of each BIOS screen. Navigational tips appear at the bottom of each BIOS screen.

Exiting the BIOS Setup Utility

1. Highlight the Exit menu by pressing the right or left arrow key.
2. Highlight your preferred exit option by pressing the up or down arrow key.
3. Press **Enter**.

Preloaded Software

When you ordered your system, you specified which software programs would ship with your system and whether they would be preloaded onto the hard disk drive.

When you first turn on your system, it will attempt to launch the preloaded software you specified when you placed your order. If the system does not indicate that it has loaded the software, verify that you completed all hardware installation procedures correctly and that all connections are firmly in place. If that doesn't solve the problem, reinstall the operating system software, following the procedures described in the documentation that came with your operating system. If the system still does not work, follow the troubleshooting instructions in Section 3.

Installing Additional Software

Installing Application Software

Application software includes commercial, off-the-shelf software packages that perform a variety of functions.

To load additional application software, follow the instructions that came with that software. These packages usually include an automated device driver installation program.

Installing Hardware Device Drivers

When you upgrade your hardware, you typically need to install hardware device drivers that will enable your operating system to recognize that hardware.

Device drivers usually come with the hardware. If not, you can often download the most current versions of device drivers from each hardware manufacturer's Web page.

Where to Go From Here

After running the BIOS Setup utility or installing additional applications or device drivers, restart your computer, and verify that the changes you made were successfully implemented. If you encounter any problems configuring your system, see Section 3.

Section 3

Troubleshooting Your System

This section focuses on some of the most common installation failures. If your workstation experiences a failure not described in this section, you may need to place a service call. This section reviews the following subjects:

- What to do when a BIOS password is forgotten
- Typical startup sequence
- Solving workstation problems
 - Preliminary checks
 - Troubleshooting an installation problem
 - Common failures
 - Components you can replace
- POST Beep Codes
- POST Messages

What to Do when a BIOS Password is Forgotten

In the event that a BIOS password is forgotten and must be changed, authorized personnel may use the following procedure to clear the current password from the system BIOS.

1. Turn the system off.
2. Remove the system unit cover, as described in Section 1 in “Removing and Replacing the System Unit Cover.”
3. Locate Jumper JP3. For jumper locations, refer to the configuration label on the inside of the system unit cover.
4. Move the jumper cap onto pins 2-3.
5. Turn the system on.
6. After the operating system has finished initializing, shut down the system.
7. Move the jumper cap onto pins 1-2.
8. Replace the system unit cover, as described in Section 1 in “Removing and Replacing the System Unit Cover.”
9. Turn the system on.
10. Start the BIOS setup utility, select the Security menu, and set a new password. See Section 2 for navigational instructions.

Typical Startup Sequence

When you turn your workstation on, the system executes a predefined set of activities related to hardware initialization, confidence testing, and so forth. This set of activities is known as a startup sequence. Your workstation must complete each action in the sequence before you can consider it operational. Here is an overview of the startup sequence.

1. Your system receives power, and lights the power LED on the front of the system unit. The power supply fan begins to rotate.

2. The system begins the Power-On Self-Test (POST). This test verifies that the system memory, system board, video controller, floppy disk drives, hard disk drives, drive controllers, and peripheral devices are all operational. The system emits one short beep to indicate that it has passed the POST.

Note: *If the POST detects an error, it displays an error message on the monitor. Also, it may emit a corresponding beep code, an error message consisting of speaker tones arranged in distinctive patterns. For information on what to do for POST errors, see "Solving Workstation Problems," later in this section.*

3. As the POST executes, it displays system settings and values (such as processor type and speed, memory size, and so forth.) Verify that these values match your actual system configuration.
 - a) If you need more time to read the screen, press the **PAUSE** key.
 - b) To resume the POST, press any key.
4. The keyboard LEDs blink on and off, and the floppy disk LED for each floppy disk drive lights briefly.
5. The hard disk LED on the front of the system unit lights.
6. If you have a properly configured hard disk drive with a boot partition that contains operating system software, the operating system load messages appear on the monitor.

Note: *If the operating system is not yet installed or the system configuration in CMOS memory is not correct, the system does not issue load messages.*

When a workstation experiences problems during startup, it either halts the sequence or generates an error message to indicate that a failure has occurred. The following paragraphs discuss some of the actions you can take to resolve an installation problem.

Solving Workstation Problems

Your system is designed for simple, trouble-free installation and use. As a rule, your first attempt to power up your equipment will be successful. However, new systems sometimes have easily remedied problems.

As mentioned, your workstation follows a specific routine each time you turn it on. Variations from this routine indicate that your equipment may have a failure. If your system does not power up normally, do not be alarmed; fixing a workstation can be as simple as reseating a loose cable. When you think about a problem, keep in mind that your best tools are common sense and deductive reasoning. The following paragraphs guide you through basic installation troubleshooting.

Preliminary Checks

If your workstation does not power up correctly after you have installed it, you may have any of several minor problems. Problems that occur the first time you turn on your system are usually the result of installation errors or an incorrect CMOS hardware configuration. Occasionally, the problem is the result of an actual hardware failure.

If your system fails when you first start it, review the installation and configuration process and reread applicable sections of this guide or other pertinent documentation. Try to answer the following questions:

- Is there a disk in drive A or drive B?
- Is the Voltage Select switch set for the correct line voltage? See the *Aquanta DL series 2 Quick Start*.
- Are all power cables connected correctly and all power switches turned on? See the *Aquanta DL series 2 Quick Start*.
- Are all interface cable connections secure and correct?
- Are all jumper and switch settings on the system board and peripheral devices correct? For information on the system board jumpers, see the configuration label on the inside of the system unit cover.

- Are all adapter boards and drives installed correctly? See Section 1, *Adding Adapter Boards*, and *Adding Drives*.
- Are the values listed in the BIOS Setup utility correct? For more on the BIOS Setup utility, see Section 2.
- Did you load the operating system on a SCSI drive when you also have an IDE hard disk drive? If your system has both a SCSI and an IDE hard disk drive, booting from a SCSI hard disk drive is not supported.

If all these items are correct and the problem recurs, or if you experience a problem that makes it impossible to answer these questions, you will have to do further troubleshooting. Read the next paragraphs to learn more about the troubleshooting process.

Troubleshooting an Installation Problem

If you have an installation failure that cannot be solved by the measures just discussed, you need to study the problem more closely. Your goal should be to systematically eliminate each possible cause of the problem until you have determined which component is causing the failure. You may find the following approach helpful.

1. If you have not already done so, turn off the system unit and the monitor.
2. If you have not already done so, disconnect any serial or parallel devices (printers, modems, and so forth) from the system unit.
3. Make sure the monitor and keyboard are correctly connected to the system unit.
4. Make sure that the system unit is connected to a properly grounded power outlet. Also verify that the Voltage Select switch is set to the correct voltage.
5. Turn on the monitor and make sure the brightness and contrast controls are turned up at least two-thirds of the way.
6. Turn on the system unit.

7. Observe the system's startup sequence. Your system should complete each of the steps described in "Typical Startup Sequence," earlier in this section. If the system does not complete a step, the component activated during that step may be faulty. For example, if the floppy disk LED does not light, you may have a bad floppy disk drive. For more on how to resolve problems of this sort, see "Common Problems," later in this section. When you have fixed the problem, return to step 1.
8. If the system issues any error messages during the startup sequence, take the appropriate corrective action. For suggestions, see "Common Problems," later in this section. When you have fixed the problem, return to step 1.

Note: *If the system only issues a beep code, or the message does not tell you enough to isolate the problem, contact your Unisys Customer Service Engineer (CSE).*

9. If you isolate the problem to a specific device (for example, a keyboard or monitor,) replace the device in question. When you have fixed the problem, return to step 1.
10. If you plan to install your operating system on a hard disk drive, partition and format the hard disk drive appropriately. For instructions, see the operating system manuals. Load the operating system from the drive.
11. Select each hard disk drive or hard disk drive partition in turn to verify that all drives and partitions can be accessed. If you cannot access the drives, the drives may be incorrectly partitioned or configured. For more information, see your operating system documentation and Section 2 of this guide.
12. If you were experiencing problems with a particular program, try running that program. If the problem recurs, see the software documentation for instructions on setting up program parameters. You can also try disabling cache memory and BIOS shadowing.

When your system passes all of the steps just described, you can consider the troubleshooting process complete. Be sure to turn off your system and reconnect any devices that you disconnected during your troubleshooting effort.

Common Problems

For ideas on how to solve problems that can occur during installation and operation, see Table 3-1. This table provides a list of common problems accompanied by several solutions. Try each solution in the order presented in the table. Each time you implement one of these solutions, test it using the procedure described in "Troubleshooting an Installation Problem," earlier in this section. If you still cannot correct the problem, contact your Unisys Customer Service Engineer for help.

Note: *Faulty devices can cause problems that are difficult to isolate. An effective approach is to replace each suspected device, one at a time, with a functioning, identical device and retest the system. If the problem disappears after you replace a device, you have isolated the problem. To find out which devices you can replace, see "Components You Can Replace," later in this section. If the problem persists, contact your Unisys Customer Service Engineer (CSE).*

Table 3-1. Common Problems and Solutions

Problem	Solution
<p>Nothing happens when I turn on the power.</p>	<p>Make sure the power outlet is live and that the system unit Voltage Select switch is set correctly.</p> <p>Make sure both ends of the system unit power cable are plugged in and securely connected.</p> <p>Make sure both ends of all other system related power cords are plugged in and securely connected.</p>
<p>My workstation periodically powers off by itself.</p>	<p>Make sure the power outlet is live and that the system unit Voltage Select switch is set correctly.</p> <p>Make sure both ends of the system unit power cable are plugged in and securely connected.</p> <p>Make sure both ends of all other system related power cords are plugged in and securely connected.</p> <p>Check the monitor interface cable to make sure neither end has been pulled free.</p>

continued

Table 3-1. Common Problems and Solutions (cont.)

Problem	Solution
<p>The fan at the back of my system does not rotate.</p>	<p>Make sure the power outlet is live and that the system unit Voltage Select switch is set correctly.</p> <p>Make sure both ends of the system unit power cable are plugged in and securely connected.</p> <p>With the power off, remove all adapter boards and disconnect all internal drives. Turn on the system. If the problem does not recur, one of the devices you removed was the cause of the problem. Replace each device one at a time, testing the system after each device is reconnected. When the problem recurs, you have found the failing device.</p>
<p>My system unit's power LED does not light.</p>	<p>Check the system unit fan. If the fan is rotating and the system is running normally otherwise, the power LED may be defective. Contact your Unisys Customer Service Engineer for help.</p> <p>If the system is not running normally, make sure the power outlet is live and that the system unit Voltage Select switch is set correctly.</p> <p>Make sure both ends of the system unit power cable are plugged in and securely connected.</p> <p>With the power off, remove all adapter boards and disconnect all internal drives. Turn on the system. If the problem does not recur, one of the devices you removed was the cause of the problem. Replace each device one at a time, testing the system after each device is reconnected. When the problem recurs, you have found the failed device.</p>

<p>The monitor screen is dark when I turn on the power.</p>	<p>Make sure the monitor power cable is plugged into a live power outlet, and that the voltage select switch is set correctly.</p>
	<p>Check the monitor interface cable to make sure neither end has been pulled free.</p>
	<p>Try turning the monitor brightness and contrast controls to their maximum settings.</p>
	<p>Make sure the system board video jumper is set correctly. For information on system board jumpers, see the configuration label on the system unit cover.</p>

continued

Table 3-1. Common Problems and Solutions (cont.)

Problem	Solution
The characters on my monitor screen are distorted.	<p>Check the monitor interface cable to make sure neither end has been pulled free.</p> <p>Make sure the monitor interface cable is not damaged.</p> <p>Use the monitor screen controls to adjust the screen values.</p> <p>Verify video driver and driver type are correct.</p>
The images on my monitor screen flicker or waver.	<p>Check the monitor interface cable to make sure neither end has been pulled free.</p> <p>Make sure the monitor interface cable is not damaged.</p> <p>Use the monitor screen controls to adjust the screen settings.</p> <p>Make sure that nearby fluorescent lights and other monitors are not causing interference.</p> <p>Verify that the video driver and driver type are correct.</p>
The entire screen is not displayed.	<p>Use the monitor screen controls to adjust the screen settings.</p>
When I type on the keyboard, the characters that appear on the monitor are incorrect.	<p>Make sure that no debris has fallen between the keys. Try turning the keyboard upside down and shaking it to dislodge any conductive material that may be shorting the keyboard contacts.</p> <p>Test the keyboard to find out whether any key is sticking. If so, replace your keyboard.</p>
When I type on the keyboard, nothing appears on the monitor screen.	<p>Check the monitor and keyboard interface cables to make sure neither cable has been pulled free.</p> <p>Make sure the keyboard interface cable is connected to the correct system unit receptacle. The keyboard cable fits in the mouse receptacle, but does not function properly in that receptacle.</p>

<p>When I move my mouse, the cursor does not move.</p>	<p>Make sure that the mouse interface cable is securely connected to the correct system unit receptacle. The mouse cable fits in the keyboard receptacle, but does not function properly in that receptacle.</p>
<p></p>	<p>Verify that the correct mouse drivers or software have been installed.</p>

continued

Table 3-1. Common Problems and Solutions (cont.)

Problem	Solution
<p>When I move my mouse, the cursor moves erratically.</p>	<p>Turn the mouse over, remove the plastic cover and the rubber ball, then clean the rubber ball and the metal contacts inside the mouse. Put the mouse back together and test it.</p>
<p>My workstation does not issue a beep code when I turn it on.</p>	<p>Check the system unit fan. If the fan is rotating and the system is running normally otherwise, the speaker may be defective. Contact your Unisys Customer Service Engineer for help.</p> <p>With the power off, remove all adapter boards and disconnect all internal drives. Turn on the system. If the problem does not recur, one of the devices you removed was the cause of the problem. Replace each device one at a time, testing the system after each device is reconnected. When the problem recurs, you have found the failed device.</p>
<p>The floppy disk LED does not light.</p>	<p>Make sure the floppy disk drive interface cable and power cable are properly connected.</p> <p>Verify that all system board jumpers related to the floppy disk drive are correctly set.</p>
<p>The hard disk LED on the front of the system unit does not light.</p>	<p>Make sure the cable from the LED to the system board is properly seated in the system board socket.</p> <p>Make sure the hard disk drive interface cable and power cable are properly connected.</p> <p>Verify that the correct hard drive configuration is stored in CMOS memory. You can check your configuration by running the BIOS Setup utility, as described in Section 2.</p>

<p>The hard disk LED on the front of the system unit is always lit or lights and turns off immediately.</p>	<p>Turn on the system unit. Listen to the system unit and try to determine whether you can hear the hard disk spinning.</p>
	<p>If your system contains two IDE drives, make sure that the jumpers on both drives are set so that one drive is a master and the other a slave. If your system contains four IDE drives, make sure that the jumpers are set so that two drives are masters and the other two are slaves.</p>
	<p>Refer to hard disk installation/troubleshooting instructions.</p>

continued

Table 3-1. Common Problems and Solutions (cont.)

Problem	Solution
My workstation does not boot when I turn it on.	<p>If your system has both an IDE drive and a SCSI hard disk drive, make sure you loaded your operating system on the IDE drive.</p> <p>Verify that the hard disk has been correctly partitioned and that the operating system was installed correctly in the boot partition.</p> <p>Make sure all system and drive jumpers are correctly set.</p> <p>Refer to the operating system manual.</p>
My workstation cannot communicate with the server.	<p>Make sure all network cables are properly connected and the network/LAN jumper settings are correct.</p> <p>Verify that the proper drivers are installed.</p>
The application software I just installed does not run properly.	<p>Make sure your software and system are correctly configured. For information on software configuration, see the manuals that came with your application.</p> <p>Make sure you are using an authorized copy of the application software.</p> <p>Check the keyboard, system board, and video jumper settings to make sure they are correct.</p> <p>Make sure that your system unit has enough memory and disk space to run the program.</p>

<p>My system and software had been running correctly, but suddenly failed.</p>	<p>If the problem is intermittent, check all cable connections and DIMMs. Also be sure there is no debris in the keyboard or mouse. Try to determine whether any other system component is experiencing random failures.</p> <p>If the problem occurs regularly, look for a noticeable pattern in the failure. For example, a problem that occurs exclusively with one file may be the result of data corruption in the file or a faulty disk. Try recreating the data file or using a new copy of the program in question.</p> <p>If you added or modified any hardware or software, remove the additions or changes one by one. If the problem disappears, it was probably the result of the last change you removed.</p>
---	---

Components You Can Replace

Your system includes a number of components and devices that you can replace yourself. If you isolate a failure to one of these devices, you can order an identical device and substitute it for the failed component. When you replace a device yourself, you lower the service costs for your system by reducing the number of service calls you place. For procedures on replacing system components, see Section 1.

Here is a list of customer-replaceable components:

- Pentium processor chips
- System memory chips (DIMMs)
- Adapter boards
- Hard disk, floppy disk, CD-ROM, and tape drives
- Monitor
- Keyboard
- Mouse
- Serial and parallel devices (printers, plotters, modems, and so forth)
- 3.6-volt lithium battery
- AC input power cables

Some of the components in your system are *not* customer-replaceable. If you isolate a hardware failure to one of these components, call your Unisys Customer Support Center for assistance. Here is a list of components that are not customer-replaceable:

- Power supply
- Motherboard (system board)
- System unit LEDs and switches
- Drive interface cables

POST Beep Codes and Error Messages

When the system BIOS encounters an error that requires your attention, it will emit a beep code or display an error message.

POST Beep Codes

Beep Code 1 consists of a single long beep followed by three short beeps. It indicates that a video error has occurred and the BIOS cannot initialize the video screen to display any additional information.

When this happens, perform the following steps until you solve the problem:

1. Make sure the monitor is receiving power.
2. Make sure the monitor cable is properly connected.
3. Make sure the video card is properly seated in its slot.
4. Make sure the correct device drivers are properly loaded.
5. Try another power cord.
6. Try another monitor.
7. Try another video card.
8. If that still doesn't solve the problem, call your Unisys Customer Service Engineer.

Beep Code 2 consists of a single long beep that repeats itself. It indicates that a DRAM error has occurred. When this happens, perform the following steps until you solve the problem:

1. Make sure each DIMM is properly seated in its slot.
2. Make sure the DIMMs are properly configured. See Section 1, "Planning Your DIMM Configuration."
3. Swap out each DIMM until you identify the bad DIMM. Configure the DIMMs in accordance with Section 1, "Planning Your DIMM Configuration."
4. If that still doesn't solve the problem, call your Unisys Customer Service Engineer.

POST Messages

If the BIOS detects an error during the POST, one of the following messages will be displayed in a box in the middle of the screen, and the message **PRESS F1 TO CONTINUE, DEL TO ENTER SETUP** appears in the information box at the bottom.

Note: *If the failing unit is one that only trained service personnel can replace, the phrase “Contact the CSE” appears in the solutions column.*

Table 3-2. POST Messages

Error Message	Description
CMOS battery has failed	The CMOS battery is no longer functional. It should be replaced.
CMOS Checksum error	The 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 as needed.
Display switch is set incorrectly	The display switch on the system board does not match the setting chosen during BIOS setup. Determine which setting is correct, then either turn off the system and change the jumper, or enter Standard CMOS Setup and change the VIDEO selection.
Floppy Disk(s) fail (80)	Tell the CSE that you are unable to reset the floppy disk subsystem.
Floppy Disk(s) fail (40)	Tell the CSE that the floppy disk types mismatch.
Hard Disk(s) fail (80)	Tell the CSE that the hard disk drive reset failed.
Hard Disk(s) fail (40)	Tell the CSE that the hard disk drive controller diagnostics failed.
Hard Disk(s) fail (20)	Tell the CSE that the your system has a hard disk drive initialization error.
Hard Disk(s) fail (10)	Tell the CSE that you are unable to calibrate the fixed disk.
Hard Disk(s) fail (08)	Tell the CSE that the hard disk drive sector failed.

continued

Table 3-2. POST Messages (cont.)

Error Message	Description
Keyboard is locked out - Unlock the key	Tell the CSE that the BIOS detects that the keyboard is locked.
Keyboard error or no keyboard present	Cannot initialize the keyboard. Make sure that the keyboard is attached correctly and no keys are being pressed during the boot.
Manufacturing POST loop	The system will endlessly repeat the POST while Pin 15 of the keyboard controller is pulled low. This pin setting is also used for the system board burn-in test.
BIOS ROM checksum error - System halted	Tell the CSE that the checksum of ROM address F0000H-FFFFFH is bad.
Memory test failed	The BIOS onboard memory test detected an error.
CMOS Battery Error	Check the BIOS setting. If that is not the problem, install a new battery.
CMOS Checksum Error	Check the BIOS setting, then Save the new BIOS setting, even if you didn't make any changes.
Display Card Mismatch	Run the BIOS Setup utility and set the Display field appropriately.
Diskette Drive Controller Error or Not Installed	Check the interface cable connection to the floppy disk drive.
Diskette Drive Error	Floppy disk may be defective. If not, contact the CSE.
Diskette Drive A Type Mismatch, Diskette Drive B Type Mismatch	Run the BIOS Setup utility and select the proper drive type.
Equipment Configuration Error	Check your system's memory configuration against the list of allowable configurations in Table 5-1.
Fixed Disk Controller Error	Run the BIOS Setup utility.
Fixed Disk 0 Error, Fixed Disk 1 Error	Check the interface cable connection to the drive.
Keyboard Error or No Keyboard Connected	Check the keyboard cable connection to the system unit.

continued

Appendix A

Specifications

This appendix provides you with some of the specifications you should observe when choosing a site for your equipment. These specifications define the climatic, mechanical, and electrical limits for your computer as a whole. If you select a site that does not meet these requirements, your computer can experience problems.

In addition to these environmental specifications, this appendix also provides internal specifications of your system; a memory map of the system, an I/O address map, the system interrupts, and the system DMA channels.

Here is a list of the topics covered in Appendix A:

- Environmental specifications
 - Operating environment
 - Non-operating environment
 - Shipping specifications
- Electrical specifications
- Memory Maps
 - Memory map
 - I/O address map
- Interrupts
- System DMA channels

Environmental Specifications

The following specifications define the environmental limits within which your equipment can be operating (turned on) or non-operating (turned off). If you are shipping a device to another site, pay close attention to the shipping specifications.

Operating Environment

The following are the conditions under which you can turn on and operate your system without damage to any of its components. Exceeding these parameters may cause damage to your system.

<i>Temperature</i>	+55.4° F to +95° F (+13° C to +35° C)
<i>Thermal change</i>	18° F per hour (10° C per hour)
<i>Relative humidity</i>	10% to 80% non-condensing
<i>Altitude</i>	Sea level to 8,000 ft (2,438.4 m)
<i>Maximum vibration</i>	0.02 in. (0.05 cm) displacement from 5 to 16 Hz; 0.25 G from 16 to 300 Hz, with a sweep rate of 0.5 octaves per minute.
<i>Shock</i>	4 Gs amplitude with a 10 ms duration, half sine wave.

Non-operating Environment

The following are the conditions under which your system will not sustain damage, as long as it is turned off. Exceeding these parameters may cause damage to your system.

<i>Temperature</i>	-40° F to +149° F (-40° C to +65° C)
<i>Thermal change</i>	54° F per hour (30° C per hour)
<i>Relative humidity</i>	0% to 95% non-condensing
<i>Altitude</i>	Sea level to 14,000 ft (4,267.2 m)
<i>Maximum vibration</i>	0.1 in. (0.254 cm) displacement from 5 to 12 Hz; 0.75 G from 12 to 300 Hz with a sweep rate of 0.5 octaves per minute.
<i>Shock</i>	20 Gs amplitude with a 10 ms duration, half sine wave.

Shipping Specifications

The following are conditions under which your system will not sustain damage, as long as it is properly packaged for shipping. These shipping specifications assume that you repack your equipment in its original container and use the original shipping material. Exceeding these parameters may cause damage to your system.

<i>Temperature</i>	-40° F to +149° F (-40° C to +65° C)	
<i>Thermal change</i>	108° F per hour (60° C per hour)	
<i>Relative humidity</i>	0% to 95%	
<i>Altitude</i>	Sea level to 14,000 ft (4,267.2 m)	
<i>Maximum vibration</i>	0.5 Gs input with a sweep rate of 5 to 200 Hz; 0.5 Gs dwell for 15 minutes at the four maximum resonant frequencies in three axes.	
<i>Shock</i>	Shipping Weight	Maximum Drop
	20 lb. (9.1 kg) or less	36 in (91.4 cm)

40 lb. (18.1 kg) or less 30 in (72.2 cm)
 60 lb. (27.2 kg) or less 24 in (61 cm)

Shipping Specifications

The following are conditions under which your system will not sustain damage, as long as it is properly packaged for shipping. These shipping specifications assume that you re-pack your equipment in its original container and use the original shipping material. Exceeding these parameters may cause damage to your system.

Temperature	-40° F. to +142° F (-40° C to +62° C)
Thermal shock	102° F per hour (60° C per hour)
Relative humidity	0% to 95%
Altitude	Sea level to 14,000 ft (4,267.2 m)
Maximum vibration	0.5 Gz input with a sweep rate of 5 to 300 Hz 0.5 Gz dwell for 15 minutes at the four maximum resonant frequencies in these areas.
Stack	Shipping Weight: 20 lb. (9.1 kg) or less Maximum Drop: 66 in (1.6 m)

Electrical Specifications

The overall system unit rating is 115/230 v, 50/60 Hz at 7.0/3.5 amp. Listed below are electrical specifications reflecting test measurements and ranges.

Note: *Your system is designed to attenuate radio frequency interference to acceptable levels. If you change or modify your system without Unisys' expressed approval, your system may generate radio interference that could void your authority to operate your equipment.*

<i>115 v range</i>	Tested at 85-135 v, 47-63 Hz
<i>230 v range</i>	Tested at 180-270 v, 47-63 Hz
<i>Power consumption</i>	285 W, fully loaded and operational
<i>Heat dissipation</i>	974 Btu/hour (245 kcal/hour)
<i>AC convenience outlet rating</i>	115 v at 2 amp 230 v at 1 amp

Memory Maps

Table A-1 provides a map of memory ranges listed in numerical order.
Table A-2 provides a map of address ranges listed in numerical order.

Table A-1. Memory Map

Hexadecimal Address	Function
000000 - 07FFFF	512 KB Host Memory
080000 - 09FFFF	128 KB Host/PCI Memory
0A0000 - 0BFFFF	128 KB PCI/ISA Video Buffer Memory
0C0000 - 0C7FFF	32 KB Video BIOS Memory
0C8000 - 0DFFFF	96 KB ISA Card BIOS and Buffer Memory
0E0000 - 0EFFFF	64 KB BIOS Extension Memory, Setup and POST Memory, PCI Development BIOS
0F0000 - 0FFFFFFF	64 KB System BIOS Memory
100000 - Upper Limit	Host Main Memory
Upper Limit - 4GB	PCI Memory

Table A-2. I/O Address Map

Hexadecimal Range	Device
0000-001F	DMA Controller-1
0020-003F	Interrupt Controller-1
0040-0047	System Timer 1
0050-0057	System Timer 2
0060-006F	Keyboard Controller-8742
0070	CMOS RAM Address and NMI Mask
0078-007B	Real Time Clock
0080-009F	DMA Page Register
00A0-00BF	Interrupt Controller-2
00C0-00DF	DMA Controller-2
0F0	Clear Math Coprocessor Busy
0F1	Reset Math Coprocessor
00F8-00FF	Math Coprocessor
01F0-01F8	Hard Disk Drive Controller
0278-027F	Reserved for Parallel Port 2
02F8-02FF	Reserved for Serial Port 2
0378-037F	Reserved for Parallel Port 1
03F0-03F7	FDD Controller
03F8-03FF	Reserved for Serial Port 1
0CF8-0CFB	PCI Mechanism #1 Configuration Register
(0CF8)	PCI Mechanism #2 Config Space Enable Register
(0CFA)	PCI Mechanism #2 Forward Register
C000-C0FF	M1531 PCI Configuration Space
C200-C2FF	M1523 PCI Configuration Space
C100-C1FF	PCI Configuration Space

Interrupts

Your system includes two interrupt controllers providing sixteen interrupts, as described in Table A-3.

Table A-3. Interrupt Assignments

Number	Function
NMI	System Board Error, I/O Channel Error (IOCHKJ signal from the ISA bus), Watchdog Timing
IRQ0	System Timer
IRQ1	Keyboard (Output Buffer Full)
IRQ2	Reserved, Cascade Interrupt from Slave PIC
IRQ3	Serial Port 2
IRQ4	Serial Port 1
IRQ5	Available for Adapter Card
IRQ6	Floppy Disk Drive Controller
IRQ7	Parallel Port 1
IRQ8	Real-Time Clock Interrupt
IRQ9	Available for Adapter Card
IRQ10	Available for Adapter Card
IRQ11	Available for Adapter Card
IRQ12	PS/2 Mouse
IRQ13	Math Coprocessor Exception
IRQ14	Primary IDE Controller or Adapter Card
IRQ15	Secondary IDE Controller or Adapter Card

System DMA Channels

Your system supports a total of eight DMA channels, as described in Table A-4.

Table A-4. DMA Channels

DMA Channel	Function
DRQ0, DACK0	Available
DRQ1, DACK1	Available
DRQ2, DACK2	Floppy Disk Drive Controller (8-bit)
DRQ3, DACK3	Available
DRQ4, DACK4	Cascade*
DRQ5, DACK5	Available
DRQ6, DACK6	Available
DRQ7, DACK7	Available

- * This function is not available for the ISA bus

Index

A

- ac power connector, 1-24
- adding drives, 1-8
- audience, ix

B

BIOS

- main screen, 2-2
- System Configuration screen, 1-12

BIOS Setup utility

- how to start, 2-2, 2-3
- running the BIOS Setup utility, 2-1

BIOS shadowing, 3-6

C

cables

- connecting peripherals
 - keyboard, 1-24
 - monitor, 1-24
 - mouse, 1-24
 - parallel port equipment, 1-24
 - serial port equipment, 1-24
- connecting to ac power, 1-24

cache memory

- installation, 1-13
- upgrade, 1-13

CMOS configuration, 3-4

component

- screws, 1-2

connecting cables, 1-24

connectors

- protecting, 1-2

conventions

used in the manual, x

Index

cover

- removing, 1-4, 1-6
- replacing, 1-5

CPU

- installation, 1-23

customer-replaceable

- components, 3-12

D

direct memory access (DMA)

- channels, A-7 to A-8

DMA channels. *See* direct memory

- access channels, A-8

drive

- installation
- 5.25-inch, 1-9

drives

- installation
- 3.5-inch, 1-10

E

electrostatic discharge, 1-3

- precautions, 1-14

error messages

- troubleshooting, 3-7

ESD, 1-3

expansion slots, 1-13

F

feature boards

- configuration rules, 1-13
- upgrade, 1-13

H

heat sink assembly
removing, 1-21

I

I/O address map, A-6
installation
 3.5-inch drives, 1-9, 1-10
 5.25-inch drives, 1-9
 cache memory, 1-13
 CPU, 1-23
 external-access 3.5-inch
 drives, 1-9
 external-access 5.25-inch
 drives, 1-9
 feature boards, 1-13
 floppy disk drives, 1-9
 IDE hard disk drives, 1-9, 1-10
 internal 3.5-inch drives, 1-10
 processor, 1-20
 SCSI drives, 1-9
 SIMMs, 1-17
 system memory, 1-17
 troubleshooting, 3-5
 verifying success, 1-12, 1-20, 1-23
 video memory, 1-13
internal drives
 installation
 3.5-inch, 1-10
 5.25-inch, 1-9
interrupt requests, A-5 to A-7
ISA boards, 1-13

J

jumpers
 reconfiguring in CPU
 installation, 1-23

K

keyboard connector, 1-24

M

manual
 general information, ix
 organization, ix
memory
 cache
 installation, 1-13
 system
 installation, 1-17
 video
 installation, 1-13
modular
 system, 1-2
monitor connector, 1-24
mouse connector, 1-24

P

parallel port connector, 1-24
password
 troubleshooting, 3-2
POST, 3-3
 beep codes, 3-13
 messages, 3-14
power cables
 internal drives, 1-8
Power LED, 3-8
Power On Self Test
 messages, 3-14
preliminary notes, 1-2
preloaded software, 2-3, 2-4
processor
 installation, 1-20
 upgrade, 1-20

R

removing components
 system unit cover, 1-4, 1-6
replacing components
 system unit cover, 1-5
running the BIOS Setup utility, 2-1

S

- SCSI drives
 - installation, 1-9
- second level cache
 - installation, 1-13
- serial port connector, 1-24
- SIMMs
 - configuration rules, 1-17
 - installation, 1-17
- socket lever, 1-21
- startup sequence, 3-2
- supplemental-drive bracket, 1-16
- system
 - upgrades, 1-1
- system memory
 - installation, 1-17
- system memory upgrade, 1-17
- system unit cover
 - removing, 1-4, 1-6
 - replacing, 1-5

T

- troubleshooting
 - application program
 - problems, 3-11
 - boot problems, 3-10, 3-11
 - cluster problems, 3-11
 - common problems, 3-7
 - disk drive problems, 3-10
 - general discussion, 3-4
 - installation problems, 3-5
 - keyboard problems, 3-9
 - monitor problems, 3-8
 - mouse problems, 3-9, 3-10
 - power problems, 3-7

U

- upgrading
 - cache memory, 1-13
 - processor, 1-20
 - system memory, 1-17
 - video memory, 1-13
- upgrading your system, 1-1

V

- video memory
 - installation, 1-13
 - upgrade, 1-13



* 3 8 1 6 6 2 7 8 - 0 0 0 *