Stingray Pentium II PCI/ISA

System Board Manual

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Introduction

Thank you for choosing the Stingray system board. The Stingray is a high performance Pentium® processor solution for the industry's most demanding workstation applications.

Based on the Intel 440FX PCIset, the Stingray supports the latest advanced processor architecture, the Pentium® II (processor-on-a-cartridge), which provides the speed and performance necessary to address the most intensive computational applications. Integrated MMX® technology, maximum memory of 1 GByte and up to 512K of Level 2 cache on the CPU make this board powerful and feature rich.

The Stingray provides features such as Extended Data Out (EDO) memory, Error Checking and Correction (ECC), pipelined-burst level 2 cache, the Award Plug and Play BIOS and Universal Serial Bus (USB) support. The USB interface has a maximum bandwidth of 12Mbps and can connect as many as 127 devices to a host system. USB supports both standard devices that operate at the full 12Mbps rate and low-end devices that use only a 1.5Mbps subchannel.

In addition, the Stingray is designed to fit into the most modern ATX form factor, which allows critical components such as floppy drive connectors, chassis fan, CPU and memory to be strategically located so that full length cards can be installed in all slots.

Micronics builds all products to exacting standards, using the highest quality components available. We are proud to provide this system board and believe you will be pleased with your purchase.

Features

The Stingray includes the following features:

▲ Single Intel Slot 1®
   Intel Pentium® II chip - 233/266/300MHz
   Integrated Voltage Regulator Module

▲ Intel 440FX PCIset
   Intel PIIX 3
   SMC FDC37C93x Ultra I/O chip

▲ 256 or 512K Pipelined Burst Level 2 in CPU package

▲ Four 32-bit PCI slots
   Four 16-bit ISA slots
   (One is a shared PCI/ISA slot)

▲ Maximum memory - 1 GByte
   Two 3.3V unbuffered 168-pin DIMM sockets
   Four 72-pin SIMM sockets
   Supports FPM and EDO DRAM memory
   ECC support via chipset when using parity DIMMs and
   SIMMs

▲ Two Universal Serial Bus (USB) ports for desktop periph-
   eral expansion

▲ Mini-ATX form factor

Software Compatibility

The Stingray system board has been thoroughly tested for compatibility with a variety of operating systems and environments, including:

▲ Microsoft
  DOS 5.0
  DOS 6.2x
  Windows 95
  Windows NT 3.5x
  Windows NT 4.0

▲ IBM
  OS/2 Warp 3.0
  OS/2 Warp 4.0

▲ SCO
  UNIXWare 2.1.1
  Open Server 5.02
  UNIX 3.2.4.2

▲ Novell Netware

Before You Begin

This manual will familiarize you with the features, installation and use of your Stingray. There are several symbols and conventions used throughout this manual to help draw your attention to a feature or to focus on important information:

When you see the Magnifying Glass, it refers to something you should take a closer look at before proceeding further.

When you see the Exclamation Mark, it gives important information on avoiding damage.

Common Names

DIMM	Dual Inline Memory Module
DRAM	Dynamic Random Access Memory
ECC	Error Checking and Correction
EDO	Extended Data Out
FPM	Fast Page Mode
IDE	Integrated Drive Electronics
PCI	Peripheral Component Interconnect
SIMM	Single Inline Memory Module
USB	Universal Serial Bus
VRM	Voltage Regulator Module

Chapter

1

Quick Installation

We know that many experienced people prefer to read as little of the documentation as possible. If this sounds like you, here's the short form to get up and running quickly.

Installing the Stingray

1. Make backup copies of your installation and configuration diskettes.

2. Ground yourself to prevent damaging static discharge by using an anti-static wrist or ankle strap, or touch a safely grounded metal object.

3. Remove the Stingray from its packaging.

4. Configure and verify the system board's jumper settings (refer to Jumper Settings in Chapter 2).

5. Install the CPU and the system memory. Be sure to attach the Retention Mechanism as described in Chapter 2.

6. Install the system board in the chassis and make all necessary case connections. NOTE: You may use either an AT or ATX power supply.

7. Install any ISA and/or PCI add-on peripherals.

8. Connect any optional devices.

9. Turn the computer on and press the <DEL> key when you see the screen shown in Figure 1.1.

```
Award Modular BIOS vX.XXXX, An Energy Star Ally
Copyright  (C) 1984-1995 Award Software, Inc.

Stingray XX

PENTIUM II CPU at XXXMHz
Memory Test: XXXXXK OK

Award Plug and Play BIOS Extension vX.XX
Copyright (C) 1995, Award Software, Inc.




To enter SETUP before Boot, Press CTRL-ALT-ESC or DEL key
```
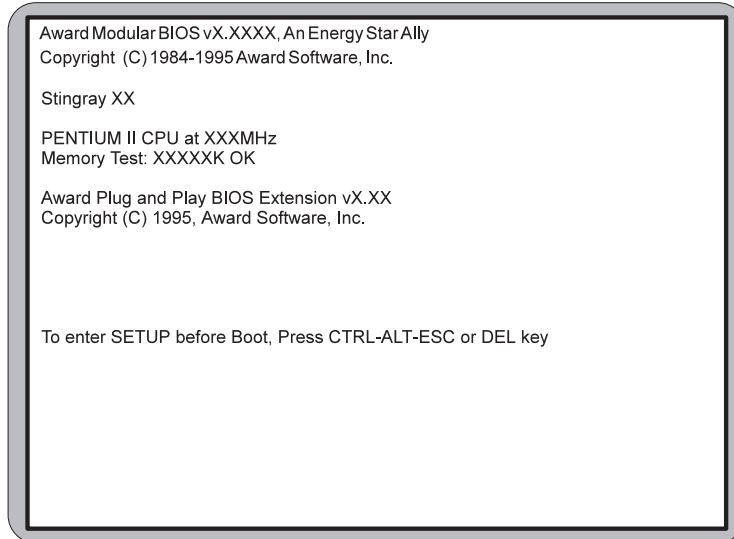
Figure 1.1: Power-Up Screen

10. If necessary, use the arrow keys to move the highlight to STANDARD CMOS SETUP and press <Enter>.

11. Set the time and date.

12. If necessary, adjust the settings for the floppy drive(s) and hard drive(s) to match your configuration. If you are installing one or more IDE drives, the BIOS automatically configures your drive(s) for you when the setting in the Type column is Auto. See Chapter 4 for additional information and additional instructions.

13. Verify that the floppy drive type(s) shown for Drive A (and Drive B, if installed) are correct. If necessary change the setting(s) for the floppy drive(s) using the <Pg Up> and/or <Pg Dn> keys or the <+> and <−> keys.

14. Verify that the amounts of memory shown in the Standard CMOS Setup screen correctly reflect the amount of RAM installed in your system.

15. Press <ESC> to return to the main setup menu.

16. Use the arrow keys to move the highlight to any of the other setup options in the main menu that contain settings you want to review or change (for information on the various setup options in the main menu, see Chapter 4). When you are finished, press <F10> to select Save & Exit Setup. You are now finished with the BIOS configuration.

Chapter

2

Configuring the Stingray

Although the Stingray system board is packaged in materials that are designed to protect it from physical damage and static electricity, it is important to use care while unpacking the board and setting it up.

Static Electricity

The Stingray is shipped from the factory in an anti-static bag. To reduce the possibility of damage from static discharge, it is important to neutralize any static charges your body may have accumulated before handling the board.

The best way to do this is to ground yourself using a special anti-static wrist or ankle strap. If you do not have an anti-static strap available, touch both of your hands to a safely grounded object, such as the power supply or chassis of a computer that is connected to the power socket. After you have grounded yourself, ground the Stingray board via one of the solder pads that surround its mounting holes. When you remove the Stingray from its packaging, place it on top of the anti-static bag, and carefully inspect the board for damage which might have occurred during shipment.

Environment Considerations

Make sure the finished computer system is in an area with good ventilation. The system should not be in direct sunlight, near heaters, or exposed to moisture, dust, or dirt.

Stingray System Board
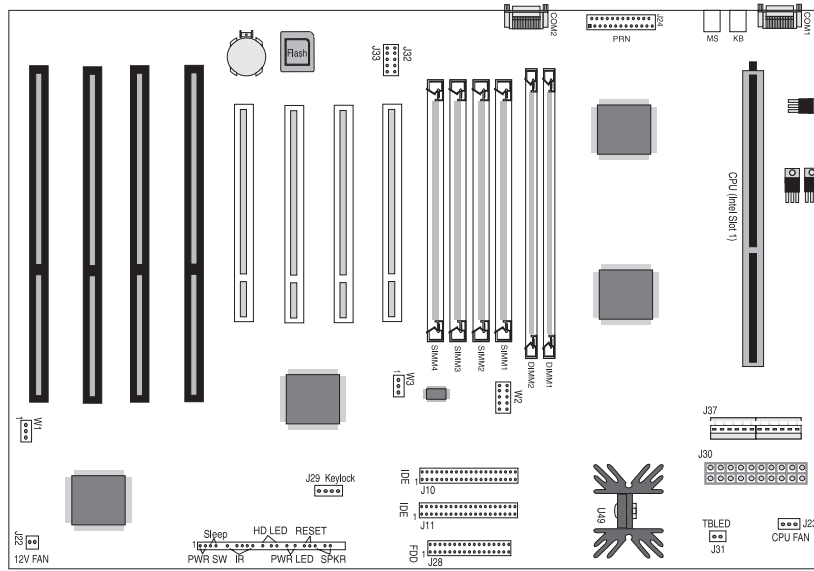
Figure 2-1. Stingray System Board Diagram

Jumper Settings

This section provides the jumper settings for the Stingray system board.

Table 2-1 lists the jumper settings to select the system speed settings.

CPU Speed	Bus Speed	W2				W3
		1-2	3-4	5-6	7-8	1-2
233MHz	66 x 3.5	Close	Open	Open	Close	1-2
266MHz	66 x 4.0	Close	Close	Close	Open	1-2
300MHz	66 x 4.5	Close	Open	Close	Open	1-2
333MHz	66 x 5.0	Close	Close	Open	Open	1-2

Table 2-1: System Speed Selection

Table 2-2 lists the settings to clear the CMOS settings. With your computer's power off, close pins 2-3, wait ten seconds and place the jumper back on pins 1-2. (The jumper must be placed back on pins 1-2 for the system to function properly.)

NOTE: This will reset all BIOS default settings. Any changes you have made will be lost.

Jumper	Function	Settings
W1	Normal	1-2
	Clear CMOS	2-3

Table 2-2: Clear CMOS Settings

Table 2-3 lists all of the connectors and their functions.

Connector	Function	Notes
J10	Primary IDE Port	
J11	Secondary IDE Port	
J22	Chassis Fan	12V
J23	CPU Fan	1 - +12V Power; 2 - Ground
J24	Parallel Port Connector	Can be disabled at the CMOS configuration screen
J28	Floppy Drive Connector	
J30	ATX Power Connector	
J31	Turbo LED	
J32	USB Connector	Port 0
J33	USB Connector	Port 1
J37	AT Power Connector	
COM 1	Serial Port (COM 1)	Can be disabled at the CMOS configuration screen
COM 2	Serial Port (COM 2)	Can be disabled at the CMOS configuration screen
CPU	Intel Slot 1	
Mouse/KB	PS/2 Keyboard & Mouse Connector	
HD LED	Hard Drive LED	1 - IDE; 2 - Positive
PWR SW	Soft Power Switch	1 -FPPwr; 2,3 - Switch On
Sleep	Sleep Switch	3 - Sleep_REQ; 4 - FPSleep_Pwr
IR	Infrared (IR)	6 - +5V; 7 - Key; 8 - Receive Data; 9 - Ground; 10 - Transmit Data; 11 - No connect
HD LED	HD LED	13 - +5V; 14 - Key; 15 - HDD Active; 16 - +5V
PWR LED	Power LED	18 - Ground; 19 - Key; 20 - Power_DRV
Reset	Reset Switch	22 - Ground; 23 - FP_Reset
SPKR	Speaker	24 - +5V; 25 - Key; 26 - Speaker Data Connect; 27 - PC Speaker Output
Keylock	Keylock Switch	1 - Power; 2 - No Connect; 3 - Ground; 4 - Keyboard Lock; 5 - Ground

Table 2-3: Connector Settings and Functions

Chapter

3

Installing the Stingray

Introduction

This chapter explains how to install the Stingray system board, memory, CPU and peripherals.

WARNING: Before installing or removing any peripherals or components, make sure you have a clear work space and that you adhere to all anti-static precautions described in Chapter 1. Micronics recommends that only trained technicians install and configure the system board.

Damage which occurs to the board while adding or removing peripherals or components may void the warranty. If problems arise while installing peripherals, contact the computer dealer where you purchased the peripheral or Micronics' Technical Support Department.

System Memory Support

The flexibility of the Stingray is augmented by its support for EDO, BEDO and FPM DRAM memory and ECC. The Stingray supports ECC (with 72-bit DIMMs or 36-bit SIMMs) via the chipset.

EDO memory is designed to keep data available to the processor for an extended period of time. The EDO memory support extends the performance of conventional DRAM memory. The result is an improvement in memory-access performance on the Stingray system board.

Installing the Stingray

Installation of the Stingray system board depends on the type of case you use. The Stingray is designed for the mini ATX form factor and must be installed in an ATX chassis.

NOTE: If you are unfamiliar with installing a system board, Micronics highly recommends that you read the computer user's manual or contact your dealer's technical support department.

Tools Required

Micronics recommends using the following tools to install the Stingray:

❏ Small Phillips screwdriver

❏ Tweezers or a pair of needle-nose pliers

❏ Tray (to hold loose screws)

Equipment Required

Micronics recommends using the following equipment with the Stingray for a typical configuration:

❏ ATX chassis with standard hardware.

❏ A high-quality ATX power supply capable of providing continuous power within a 3 volt range. A power filter may be used with a noisy AC power source.

❏ PS/2 mouse and compatible keyboard.

❏ Eight ohm speaker.

❏ Standard ribbon cables for internal connections.

❏ Standard power cord (grounded).

System Memory

System memory is necessary to operate the Stingray system board. The Stingray supports DIMM modules and/or SIMM modules for a maximum of 1 GByte of memory. There are two 168-pin 3.3V unbuffered DIMM sockets. Each DIMM socket provides a 72-bit wide data path. There are four 72-pin SIMM sockets. Each SIMM socket provides a 36-bit wide data path.

Support is provided for EDO, BEDO and FPM DRAM memory. This section list the rules for adding memory to the Stingray, give some examples of common memory configurations and show how to physically install the memory.

Adding Memory

The following is a list of rules to follow when installing DIMMs and SIMMs. If you follow these rules, your upgrade should be trouble-free:

❑ Use 70ns or faster DIMMs and SIMMs.
NOTE: For long term reliability, Micronics recommends using DIMMs with gold-plated contacts and SIMMs with tin-plated contacts.

❑ SIMM memory modules support FPM and EDO DRAM memory types. DIMM memory modules support FPM and EDO (unbuffered) memory types.

❑ Singled-sided and double-sided memory modules are supported.

❑ The same type and size of memory for every bank recommended. Different memory types and sizes in separate banks will cause the performance of the memory to run at the speed of the slowest RAM installed.

Memory Usage

The following information lists sample configurations for
utilizing both SIMM and DIMM memory modules:

SIMM Configurations

S1 S2 S3 S4

       D1 D2

or

S1 S2 S3 S4

       D1 D2

or

S1 S2 S3 S4

       D1 D2

DIMM Configurations

S1 S2 S3 S4

       D1 D2

or

S1 S2 S3 S4

       D1 D2
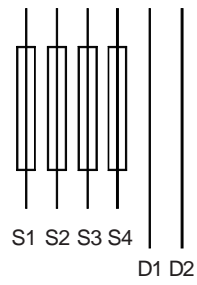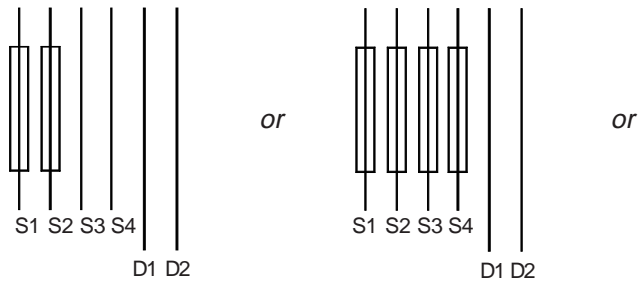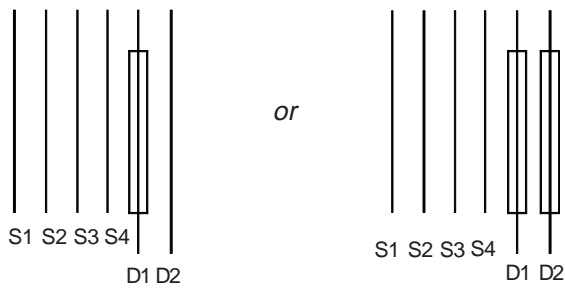
SIMM and DIMM Configurations

S1 S2 S3 S4   *or*   S1 S2 S3 S4   *or*

D1 D2   D1 D2

S1 S2 S3 S4

D1 D2
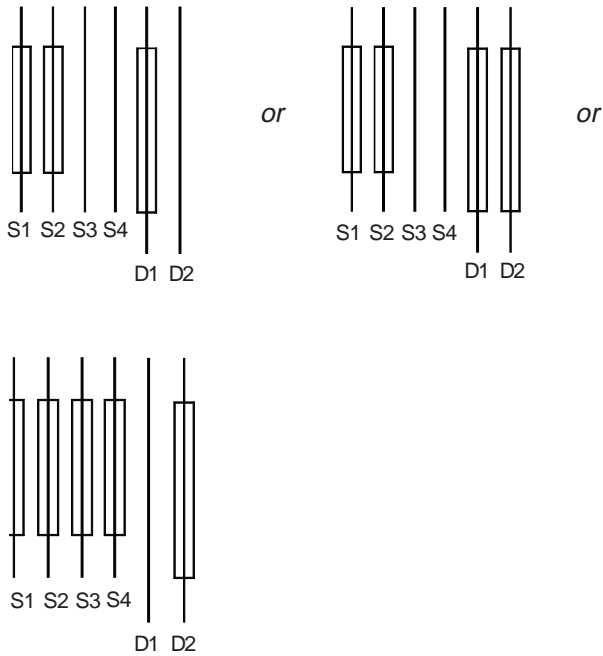
S = SIMM
D = DIMM

NOTE:

DIMM socket 1 is a shared socket with SIMM sockets 3 and 4. A shared socket means that either SIMMs or DIMMs may occupy, but not together. Therefore, if you are using a DIMM in DIMM socket 1, you may not use SIMM sockets 3 and 4 at the same time.

Memory Configurations

The following table lists the most common memory con-figurations. The memory available depends on the number of DIMMs and/or SIMMs installed.

Memory Size	SIMM 1	SIMM 2	SIMM 3	SIMM 4	DIMM 1	DIMM 2
8MB	1Mx32	1Mx32	-	-	-	-
16MB	2Mx32	2Mx32	-	-	-	-
16MB	1Mx32	1Mx32	1Mx32	1Mx32	-	-
24MB	1Mx32	1Mx32	2Mx32	2Mx32	-	-
32MB	4Mx32	4Mx32		-	-	-
32MB	2Mx32	2Mx32	2Mx32	2Mx32	-	-
40MB	1Mx32	1Mx32	4Mx32	4Mx32	-	-
48MB	2Mx32	2Mx32	4Mx32	4Mx32	-	-
64MB	8Mx32	8Mx32		-	-	-
64MB	4Mx32	4Mx32	4Mx32	4Mx32	-	-
72MB	1Mx32	1Mx32	8Mx32	8Mx32	-	-
80MB	2Mx32	2Mx32	8Mx32	8Mx32	--	--
96MB	4Mx32	4Mx32	8Mx32	8Mx32	-	-
128MB	16Mx32	16Mx32	-	-	-	-
128MB	8Mx32	8Mx32	8Mx32	8Mx32	-	-
136MB	1Mx32	1Mx32	16Mx32	16Mx32	-	-
144MB	2Mx32	2Mx32	16Mx32	16Mx32	-	-
160MB	4Mx32	4Mx32	16Mx32	16Mx32	-	-
256MB	32Mx32	32Mx32	-	-	-	-

Table 3-1: Memory Configurations (SIMMs Only)

Memory Size	SIMM 1	SIMM 2	SIMM 3	SIMM 4	DIMM 1	DIMM 2
24MB	1Mx32	1Mx32	1Mx32	1Mx32	-	-
32MB	1Mx32	1Mx32	1Mx32	1Mx32	-	-
48MB	1Mx32	1Mx32	1Mx32	1Mx32	-	-
48MB	2Mx32	2Mx32	2Mx32	2Mx32	-	-
64MB	2Mx32	2Mx32	2Mx32	2Mx32	-	-
80MB	1Mx32	1Mx32	1Mx32	1Mx32	-	-
96MB	2Mx32	2Mx32	2Mx32	2Mx32	-	-
96MB	4Mx32	4Mx32	4Mx32	4Mx32	-	-
128MB	4Mx32	4Mx32	4Mx32	4Mx32	-	-
144MB	1Mx32	1Mx32	1Mx32	1Mx32	-	-
160MB	2Mx32	2Mx32	2Mx32	2Mx32	-	-
192MB	8Mx32	8Mx32	16Mx32	16Mx32	-	-
192MB	4Mx32	4Mx32	4Mx32	4Mx32	-	-
192MB	8Mx32	8Mx32	8Mx32	8Mx32	-	-
256MB	16Mx32	16Mx32	16Mx32	16Mx32	-	-
256MB	8Mx32	8Mx32	8Mx32	8Mx32	-	-

Table 3-2: Memory Configurations (SIMMs Only)

Memory Size	SIMM 1	SIMM 2	SIMM 3	SIMM 4	DIMM 1	DIMM 2
8MB	-	-	-	-	1Mx64	-
16MB	-	-	-	-	2Mx64	-
16MB	-	-	-	-	1Mx64	1Mx64
24MB	-	-	-	-	1Mx64	2Mx64
32MB	-	-	-	-	4Mx64	-
32MB	-	-	-	-	2Mx64	2Mx64
40MB	-	-	-	-	1Mx64	4Mx64
48MB	-	-	-	-	2Mx64	4Mx64
64MB	-	-	-	-	8Mx64	-
64MB	-	-	-	-	4Mx64	4Mx64
72MB	-	-	-	-	1Mx64	8Mx64
80MB	-	-	-	-	2Mx64	8Mx64
96MB	-	-	-	-	4Mx64	8Mx64
128MB	-	-	-	-	8Mx64	8Mx64
256MB	-	-	-	-	16Mx64	16Mx64

Table 3-3: Memory Configurations (DIMMs Only)

Memory Size	Bank 0		Bank 1			
	SIMM 1	SIMM 2	SIMM 3	SIMM 4	DIMM 1	DIMM 2
8MB	*1Mx32 1Mx32 to 16Mx32 16Mx32 in any combination*		-	-	1Mx64	-
			-	-	2Mx64	-
			-	-	4Mx64	-
			-	-	8Mx64	-
to			-	-	1Mx64	1Mx64
			-	-	1Mx64	2Mx64
			-	-	1Mx64	4Mx64
			-	-	1Mx64	8MBx64
			-	-	2Mx64	2Mx64
			-	-	2Mx64	4Mx64
			-	-	2Mx64	8Mx64
			-	-	4Mx64	4Mx64
256MB			-	-	4Mx64	8Mx64
			-	-	8Mx64	8Mx64
24MB	*1Mx32 1Mx32 to 16Mx32 16Mx32 in any combination*				-	1Mx64
to					-	2Mx64
					-	4Mx64
256MB					-	16Mx64

Table 3-4: Memory Configurations (SIMMs & DIMMs)

NOTE:

❏ Use the same type and size of memory for every bank.

❏ When mixing different memory types, the memory will default to the speed of the slowest RAM installed.

Installing DIMMs

To install the DIMMs, locate the memory banks on the system board and perform the following steps:

1. Hold the DIMM so that the notched edge is aligned with the notch on the DIMM socket (Figure 3-2).

2. Insert the DIMM at a 90 degree angle.

3. Gently push the DIMM straight down until it locks into place (past the release tabs).
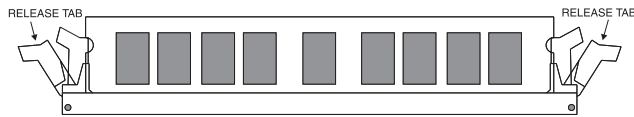
Figure 3-1: Installing a 168-Pin DIMM

Removing DIMMs

To remove DIMMs, follow the steps below:

1. With both thumbs (or fingers), press the release tabs away from the socket.

2. With the DIMM free from the release tabs, lift the module up and place in an anti-static bag or package.

Installing SIMMs

To install the SIMMs, locate the memory banks on the system board and perform the following steps:

1. Hold the SIMM so that the notched edge is aligned with the notch on the SIMM socket (Figure 3-1).

2. Insert the SIMM at a 45 degree angle.

3. Gently push the SIMM into an upright position until it locks into place (past the release tabs).
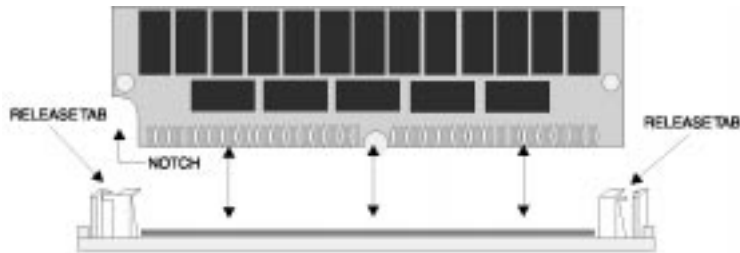
Figure 3-2: Installing a 72-Pin SIMM

Removing SIMMs

To remove SIMMs, follow the steps below:

1. With both thumbs (or fingers), press the release tabs away from the socket.

2. With the SIMM free from the release tabs, lift the module up and place in an anti-static bag or package.

CPU Installation

The Stingray is designed to support Pentium II processors. The Pentium II processor comes installed in a Single Edge Contact (SEC) cartridge that connects into "Slot 1" on the system board.

A Retention Mechanism is supplied to anchor the processor to the system board. Attach the Retention Mechanism before inserting the processor.

Installing the CPU Retention Mechanism

Before you begin, verify that your Retention Mechanism Kit contains the following items:

❏   Retention Base (black plastic module)

❏   Support Bridges with Studs (plastic mounts).

Retention
Base

Support Bridge
with Studs
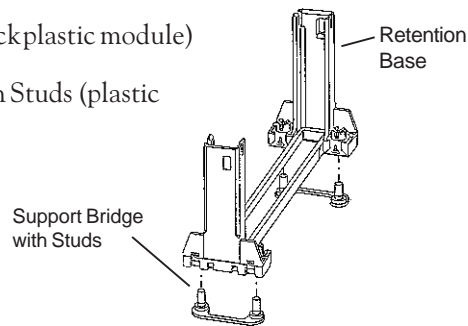
Follow the steps below to install the kit:

1.   Locate the four Retention Base holes (near each end of the Slot 1 socket). Insert the two Support Bridges with studs (plastic mounts) from the bottom side of the Stingray toward the component side until they snap into place.

(Orient the loops toward
the outer edges of the
system board)
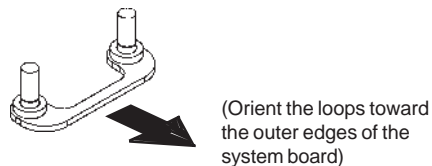
2. Place the Retention Base over the Slot 1 connector and insert it down into the Support Bridges with studs. Note the "Keyed" location of both Slot 1 and the Retention Base.
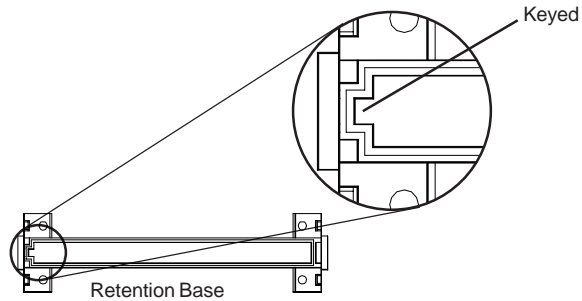
3. Using a screwdriver, tighten all four sides of the Retention Base.
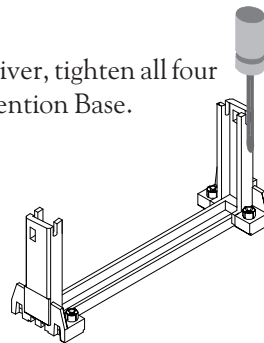
Installing a CPU

Follow the steps below to install the Pentium II processor:

1. Locate the Slot 1 connector (refer to Figure 2-1).

2. If you are installing the boxed version of the Pentium II processor, follow the instructions in the section "CPU Installation (Boxed version)."

3. If you are installing the *optional* Heat Sink Support, continue to step 4; if not, go to step 5.

4. The Heatsink components consist of a top bar, base and two pins. Gently insert the Heatsink base into the holes next to the DIMM 1 socket. Push down until the base snaps into place.
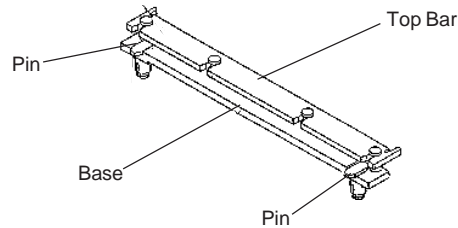
5. Gently insert the processor cartridge down into the Retention Module, making sure the connector on the processor cartridge and the connector on the Slot 1 connector are aligned (refer to the keyed location on the previous page).

6. Push the processor cartridge down until it snaps into place.

7. Lock the processor cartridge into place by pushing outward on the tabs located on both sides of the processor cartridge. The processor cartridge is locked when the tabs snap into the holes on the side of the Bridge.

8. After the processor cartridge is locked into place, connect the Heatsink's top bar to the base.

9. Lock the base into place by inserting a pin down into the base on both sides.

10. Make sure the speed selection jumpers are set correctly (refer to Chapter 2 - Jumper Settings).

CPU Installation Overview

CPU Installation Overview

1. Mount the Retention Mechanism for the CPU.

2. Mount the (optional) heatsink support base onto the system board.

3. Slide the CPU into the Retention Mechanism.

4. Lock the CPU into the Retention mechanism using the tabs.

5. Slide in the Heat Sink Top Bar, then insert the pins to lock it in place.
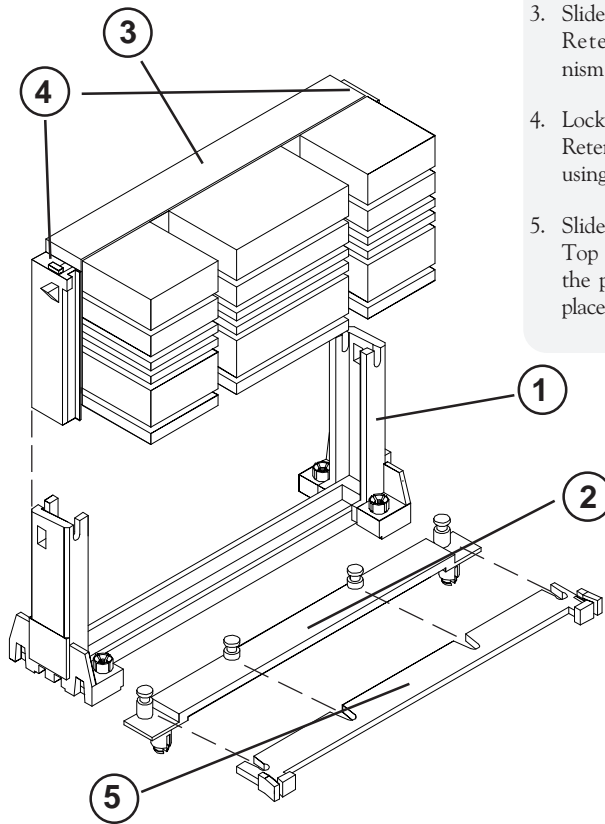
Figure 3-4: Installing a CPU

CPU Installation (Boxed version)

A boxed version of the CPU is offered through Intel. This packaging uses an active cooling fan. The mounting hardware is described below. For detailed instructions, please refer to the documentation that is supplied with your CPU.

NOTE: Make sure the speed selection jumpers are set correctly (refer to Chapter 2 - Jumper Settings).
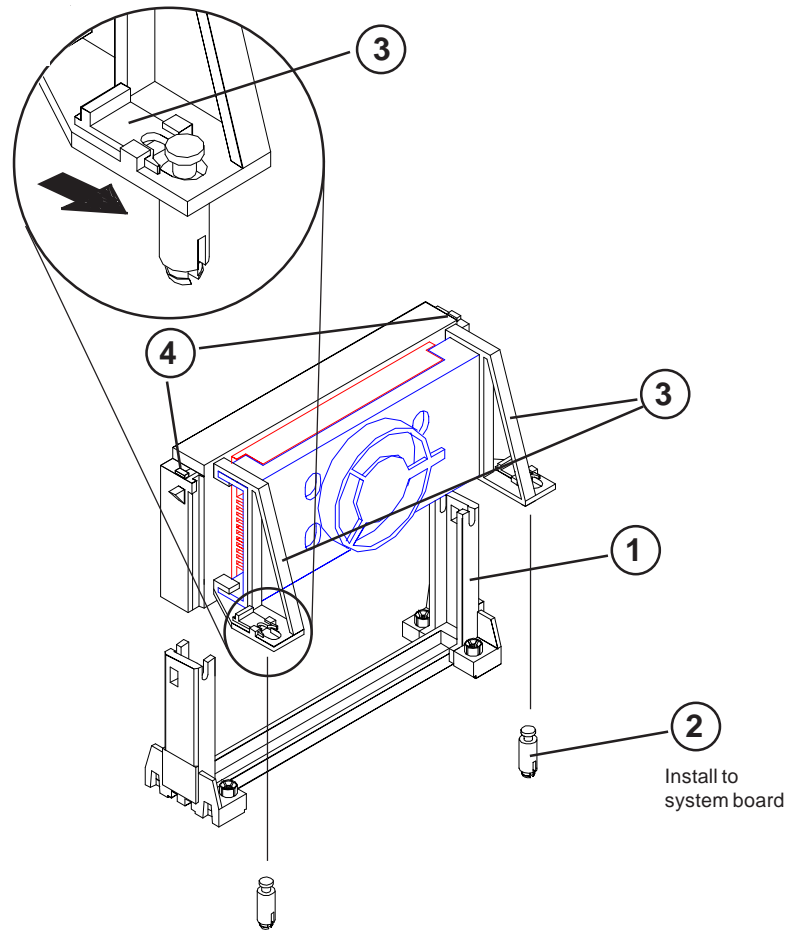
Figure 3-3: Installing a CPU (Boxed version)

Installing a PCI Peripheral Card

Micronics PCI slots accommodate all PCI peripherals that meet the PCI 2.1 specifications. Follow the steps below to install a PCI card:

1. Turn the computer system off and remove its cover.

2. Choose an unused PCI slot and remove the slot cover.

3. Insert the card with the bottom edge level to the slot. *Never insert the card at an angle.*

4. Carefully push the card straight down, making sure the card is fully inserted.

5. Replace the screw which holds the card in place.

6. Replace the computer cover.

7. Refer to the PCI card's documentation additional instructions regarding installation and software drivers.
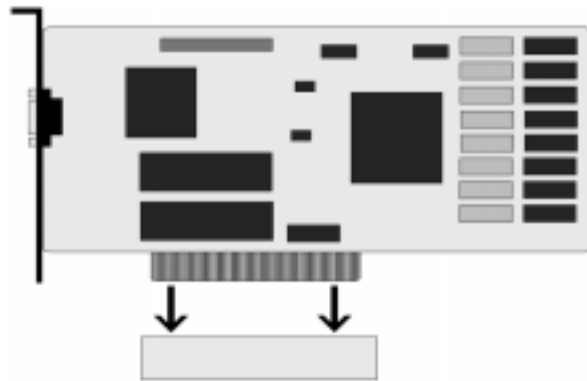
Figure 3-4: Installing a PCI Card

Installing an ISA Peripheral Card

Micronics ISA slots accommodate all standard ISA pe-
ripherals. Follow the steps below to install a PCI card:

1. Turn the computer system off and remove its cover.

2. Choose an unused ISA slot and remove the slot cover.

3. Insert the card with the bottom edge level to the slot.
    Never insert the card at an angle.

4. Carefully push the card straight down, making sure
    the card is inserted fully.

5. Replace the screw that holds the card in place.

6. Replace the computer cover.

7. Refer to the ISA card's documentation for additional
    instructions regarding installation and software driv-
    ers.
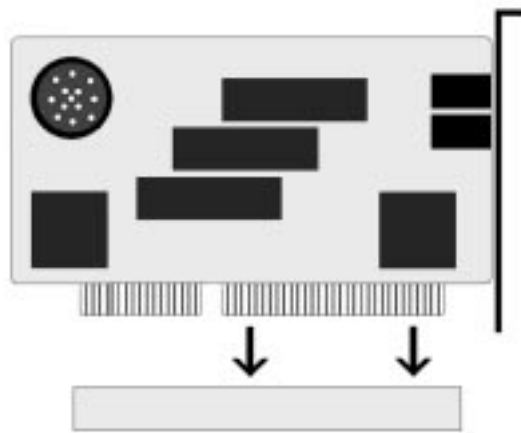
Figure 3-5: Installing an ISA Peripheral Card

Chapter

4

The BIOS Setup Utility

Configuration

After the Stingray system board and all hardware is installed, the system is ready for configuration. Before turning on the computer, make sure all cables are correctly connected and all jumpers are correctly set.

We recommend that you keep the computer cover off the first time you boot the system. This makes it faster and easier to correct any difficulties that might arise.

Initial Boot Up

Power up the Stingray. If the system does not properly boot, check all your cables and peripherals for bad connections. You may also get beep codes or error messages. If this occurs, consult Appendix B for a guide to possible solutions.

After the system properly boots, it is ready to be configured. The following information explains the proper procedures for BIOS configuration.

Setup

The Setup program is used to configure the computer's BIOS (Basic Input/Output System). The computer's BIOS is responsible for configuring the system board and providing hardware information to the operating system. In order for the computer to run properly, run the Setup procedure after first installing the system board and whenever you make a hardware change to the system.

When the system is turned on, it performs a memory test, and a BIOS identification and system information screen is displayed on your monitor, as shown in Figure 4-1.

```
Award Modular BIOS vX.XXXX, An Energy Star Ally
Copyright (C) 1984-1995 Award Software, Inc.

Stingray XX

PENTIUM II CPU at XXXMHz
Memory Test: XXXXXK OK

Award Plug and Play BIOS Extension vX.XX
Copyright (C) 1995, Award Software, Inc.




To enter SETUP before Boot, Press CTRL-ALT-ESC or DEL key
```
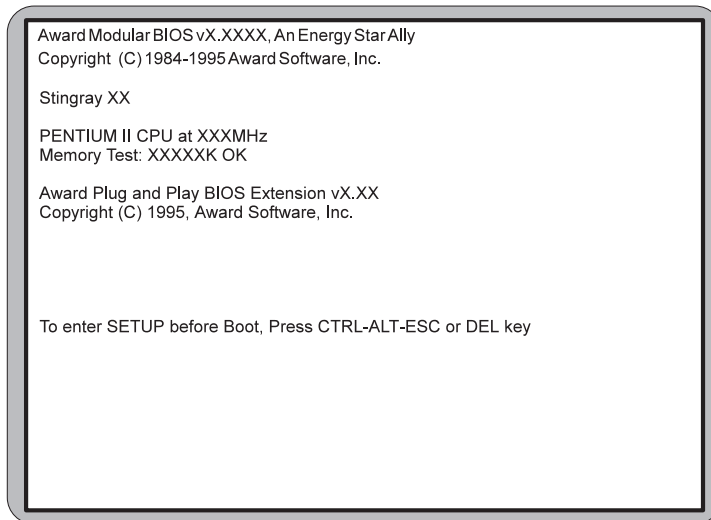
Figure 4-1: Power-Up Screen

When "To enter Setup before boot, press CTRL-ALT-ESC or DEL key" appears at the bottom of the screen, press the <DEL> key to start the Setup program. The main CMOS Setup utility screen (Figure 4-2) appears. Note that the Setup program can only be activated during the boot sequence.

```
                          CMOS SETUP UTILITY
                  AWARD SOFTWARE, INTERNATIONAL INC.

      STANDARD CMOS SETUP              INTEGRATED PERIPHERALS
      BIOS FEATURES SETUP              SUPERVISOR PASSWORD
      CHIPSET FEATURES SETUP           USER PASSWORD
      POWER MANAGEMENT SETUP           IDE HDD AUTO DETECTION
      PNP/PCI CONFIGURATION SETUP      HDD LOW LEVEL FORMAT
      LOAD BIOS DEFAULTS               SAVE AND EXIT SETUP
      LOAD SETUP DEFAULTS              EXIT WITHOUT SAVING


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


              Onboard I/O, IRQ, DMA Assignment...
```

Figure 4-2: Main CMOS Setup Screen

Running the Setup Program

The Stingray system board has six primary CMOS configuration screens: main setup menu, Standard CMOS Setup, BIOS Features Setup, Chipset Features Setup, PNP/PCI Configuration and Integrated Peripherals screen.

In addition, there are four screens containing options that do not have to be set unless you want to: the Power Management Setup screen, the Supervisor Password, the User Password and the IDE HDD Auto Detection screen. The main menu screen also contains the following options: Load BIOS Defaults, Load Setup Defaults, HDD Low Level Format, Save & Exit Setup and the Exit Without Saving.

To select any of these screens or options, use the arrow keys ($<\uparrow\leftarrow\downarrow\rightarrow>$) to move the highlight to the desired item and press <Enter>. *NOTE: A brief description of each highlighted selection appears at the bottom of the screen.*

Standard CMOS Setup

The STANDARD CMOS SETUP allows checking or modification of general configuration information. To access the STANDARD CMOS SETUP screen, high-light this option on the main menu screen and press <Enter>.

```
                    ROM PCI/ISA BIOS (2A69H000)
                       STANDARD CMOS SETUP
                       AWARD SOFTWARE, INC.

   Date (mm:dd:yy) : Mon, Mar 3 1997
   Time (hh:mm:ss) : 15 : 5 : 29

   HARD DISKS       TYPE  SIZE  CYLS  HEAD  PRECOMP  LANDZ  SECTOR  MODE

   Primary Master   Auto    0     0     0        0      0        0  Auto
   Primary Slave    Auto    0     0     0        0      0        0  Auto
   Secondary Master Auto    0     0     0        0      0        0  Auto
   Secondary Slave  Auto    0     0     0        0      0        0  Auto


   Drive A  :  1.44MB 3.5"
   Drive B  :  None                         Base Memory :      0K
                                        Extended Memory :      0K
   Video    :  EGA/VGA                      Other Memory :    512K
   Halt On  :  All Errors                   Total Memory :    512K


   Esc : Quit                ↑↓→← : Select Item       PU/PD/+/- : Modify
   F1  : Help                (Shift) F2 : Change Color
```

Figure 4-3. Standard CMOS Setup Screen

Date and Time

To set the date, use <→/←↑/↓> arrow keys to highlight the date and follow the same procedure to set the time.

Hard Disks Setup

The BIOS supports up to four IDE drives. You can specify the physical and electronic properties of the disk drives installed. Relevant specifications include the type, num-ber of cylinders (CYLS), heads (HEAD), write pre-

compensation time (PRECOMP), read/write head landing zone (LANDZ), number of sectors per track (SECTOR), and HDD mode (MODE). *NOTE: We recommend that you select type Auto for all drives.*

Diskette A or B

To configure a floppy drive added to or removed from your computer, use $<\rightarrow/\leftarrow\uparrow/\downarrow>$ arrow keys to select the desired drive. Use the $<PU/PD/+/->$ arrow keys to change the setting until it matches the floppy drive you installed. The BIOS supports 2.88MB, 1.44MB, 1.2MB, 720KB and 360KB floppy drives.

Video

Select the type of video card installed into your system. The default setting is EGA/VGA.

Halt On

During the Power-On Self-Test (POST), the system stops if the BIOS detects a hardware error. The default setting is All Errors.

Base/Extended/Other Memory

A small section in the lower right corner of the screen displays important information about your system that includes the base, extended and other memory sizes. They are updated automatically by the Setup program according to the status detected by the BIOS self-test.

BIOS Features Setup

This feature allows you to set the Award enhanced BIOS options of your choice, such as External Cache and boot operations. To access the BIOS FEATURES SETUP screen, highlight this option on the main menu screen and press <Enter>.

```
                    ROM PCI/ISA BIOS (2A69H000)
                      BIOS FEATURES  SETUP
                      AWARD SOFTWARE, INC.

   CPU Internal Cache        Disabled      Video BIOS Shadow        Disabled
   External Cache            Disabled      C8000-CBFFF Shadow       Disabled
   Quick Power On Self Test  Disabled      CC000-CFFFF Shadow       Disabled
   Boot Sequence             A, C, SCSI    D0000-D3FFF Shadow       Disabled
   Swap Floppy Drive         Disabled      D4000-D7FFF Shadow       Disabled
   Boot Up Floppy Seek       Disabled      D8000-DBFFF Shadow       Disabled
   Boot Up Numlock Status    Off           DC000-DFFFF Shadow       Disabled
   Gate A20 Option           Fast
   Security Option           Setup
   PCI/VGA Palette Snoop     Disabled
   OS Select for DRAM > 64MB Non-OS2



                                    ESC  :   Quit              : Select Item
                                    F1   :   Help      PU/PD/+/- :  Modify
                                    F5   :   Old Values  (Shift)F2  :  Color
                                    F6   :   Load BIOS Defaults
                                    F7   :   Load SETUP  Defaults
```

Figure 4-4: BIOS Features Setup Screen

CPU Internal Cache

This selection enables the internal cache of the Intel Pentium II CPU. The default setting is Disabled.

External Cache

The External Cache selection enables or disables the external (L2) cache and the onboard secondary cache. The default setting is Disabled.

Quick Power-On Self-Test

When enabled, this selection will reduce the amount of time required to run the Power-On Self-Test (POST). A quick POST skips certain steps. We recommend that you disable quick POST. The default setting is Disabled.

Boot Sequence

Boot Sequence selects the order in which the system searches for a boot disk. The default setting is A, C, SCSI.

Swap Floppy Drive

This selection can be set to remap the floppy drives. When set to Disabled (default), drive A: becomes drive B: and drive B: becomes drive A:.

Boot Up Floppy Seek

When set to Disabled (default), the BIOS tests (seeks) floppy drives to determine whether they have 40 or 80 tracks. Drives with 720KB, 1.2MB and 1.44MB capacity all have 80 tracks. The default setting is Disabled.

Boot Up Numlock Status

Toggle between On and Off to control the state of the Numlock key when the system boots. When toggled On, the numeric keypad generates numbers instead of controlling cursor operations. The default setting is Off.

Gate A20 Option

Gate A20 refers to the way the system addresses memory above 1MB (extended memory). When set to Fast (default), the system chipset controls Gate A20. When set to Normal, a pin in the keyboard controller controls Gate

A20. Setting Gate A20 to Fast improves system speed, particularly with OS/2 and Windows.

Security Option

This selection determines whether the password will be asked for at every system boot or only when entering into the Setup (default) program.

PCI/VGA Palette Snoop

Alters the VGA palette setting while graphic signals pass through the feature connector of the VGA card and are processed by the MPEG card. Enable this option only if you have MPEG connections through the VGA feature connector; this means you can adjust PCI/VGA palettes. The default setting is Disabled.

OS Select for DRAM>64MB

This selection allows you to select the amount of memory installed for your operating system. Select NON-OS2 (default) if your operating system has less than 64MB of memory or if running a non-OS/2 operating system. If your operating system has more than 64MB of memory installed, select the OS2 setting.

Video BIOS Shadow

Enabling this selection allows you to shadow the BIOS on the video card for faster video performance. Some video cards do not support video BIOS shadowing. Disable this option if problems occur.

Chipset Features Setup

The Chipset Features Setup allows you to program the Intel 440FX PCI chipset features. To access the CHIPSET FEATURES SETUP screen, highlight this option on the main menu screen and press <Enter>.

```
                    ROM PCI/ISA BIOS (2A69H000)
                     CHIPSET FEATURES  SETUP
                       AWARD SOFTWARE, INC.

  Auto Configuration          Enabled      8-bit I/O Recovery Time    2
  DRAM Speed Selection        70ns         16-bit I/O Recovery Time   1
  DRAM RAS# Precharge Time    3            Memory Hole At 15M-16M     Disabled
  MA Additional Wait State    Enabled      DRAM Fast Leadoff          Disabled
  Fast RAS# to CAS# Delay     Disabled     Passive Release            Disabled
  DRAM Read Burst (B/E/F)     x1/2/3       Delayed Transaction        Disabled
  DRAM Write Burst (B/E/F)    x4/4/4
  ISA Bus Clock               PCICLK/3
  DRAM Refresh Queue          Enabled
  DRAM RAS Only Refresh       Disabled
  DRAM ECC/Parity Select      Disabled
  Fast DRAM Refresh           Disabled
  Read-Around-Write           Enabled
  PCI Burst Write Combine     Enabled
  PCI-To-DRAM Pipeline        Enabled
  CPU-To-PCI Write Post       Enabled
  CPU-To-PCI IDE Posting      Enabled      ESC  :  Quit          ↑↓→← : Select Item
  System BIOS Cacheable       Disabled     F1   :  Help        UP/DN/+/- : Modify
  Video RAM Cacheable         Disabled     F5   :  Old Values   (Shift) F2  : Color
                                           F6   :  Load BIOS Defaults
                                           F7   :  Load SETUP  Defaults
```

Figure 4-5: Chipset Features Setup Screen

Auto Configuration

Auto Configuration selects predetermined optimal values of the chipset parameters. When Disabled, chipset parameters revert to setup information stored in CMOS. Many fields in this screen are not available when Auto Configuration is Enabled.

DRAM Speed Selection

The value in this field must correspond to the speed of the DRAM installed in your system. *Before changing this selec-*

tion, verify the speed of the DRAM currently installed. This value is access speed, so a lower value means a faster system.

DRAM RAS# Precharge Time

The precharge time is the number of cycles it takes for the RAS to accumulate its charge before DRAM refresh. If insufficient time is allowed, refresh may be incomplete and the DRAM may fail to retain data.

MA Additional Wait State

Selecting Enabled inserts an additional wait state before the beginning of a memory read. The setting of this parameter depends on the system board design. Do not change from the manufacturer's default setting unless you are getting memory addressing errors.

Fast RAS# to CAS# Delay

This selection allows you to insert a timing delay between the CAS and RAS strobe signals, used when DRAM is written to, read from, or refreshed. Disabled gives faster performance; and Enabled gives more stable performance.

DRAM Read Burst (B/E/F)

Set the timing for burst-mode reads from DRAM. The lower the timing numbers, the faster the system addresses memory

DRAM Write Burst (B/E/F)

Set the timing for burst-mode writes from DRAM. The lower the timing numbers, the faster the system addresses memory.

ISA Bus Clock

You can set the speed of the AT bus here. The settings are tied to the speed of the PCI bus. If the PCI bus operates at 33 MHz, a setting of PCICLK/4 (default) would yield an ISA bus speed of approximately 8 MHz, the standard speed of the ISA bus. While most devices operate at higher ISA bus speeds, try a slower bus speed if your ISA device does not function properly at a high bus speed.

DRAM Refresh Queue

When Enabled, you can queue up to four DRAM refresh requests, so DRAM can refresh at optimal times. Disabled makes all refreshes priority requests.

DRAM RAS Only Refresh

An alternate to CAS-before-RAS refresh. Leave Disabled (default) unless your DRAM requires this older method of refresh generation.

DRAM ECC/Parity Select

Select Parity, ECC or Disabled, depending on the type of DRAM installed in your system.

Fast DRAM Refresh

The cache DRAM controller offers two refresh modes, *Normal* and *Hidden*. In both modes, CAS takes place before RAS but the Normal mode requires a CPU cycle for each. Alternately, a cycle is eliminated by "hiding" the CAS refresh in Hidden mode. Not only is the Hidden mode faster and more efficient, but it also allows the CPU to maintain the status of the cache even if the system goes into a power management "suspend" mode.

Read-Around-Write

DRAM optimization feature. If a memory read is addressed to a location whose latest write is being held in a buffer before being written to memory, the read is satisfied through the buffer contents and is not sent to the DRAM.

PCI Burst Write Combine

When this selection is *Enabled*, the chipset assembles long PCI bursts from the data held in these buffers.

PCI-To-DRAM Pipeline

DRAM optimization feature. When Enabled, full PCI-to-DRAM write pipelining is enabled. Buffers in the chipset store data written from the PCI bus to memory. When Disabled, PCI writes to DRAM are limited to a single transfer per write cycle.

CPU-To-PCI Write Post

When this field is Enabled, writes from the CPU to the PCI bus are buffered to compensate for the speed differences between the CPU and the PCI bus. When Disabled, the writes are not buffered and the CPU must wait until the write is complete before starting another write cycle.

CPU-To-PCI IDE Posting

Select Enabled to post write cycles from the CPU to the PCI IDE interface. IDE accesses are posted in the CPU to PCI buffers, for cycle optimization.

System BIOS Cacheable

Selecting Enabled allows caching of the system BIOS ROM at F0000h-FFFFFh, resulting in better system performance. However, if any program writes to this memory area, a system error may result.

Video RAM Cacheable

Selecting Enabled allows caching of the video BIOS ROM at C0000h to C7FFFh, resulting in better video performance. However, if any program writes to this memory area, a system error may result.

8-Bit/16-Bit I/O Recovery Time

The I/O recovery mechanism adds bus clock cycles between PCI-originated I/O cycles to the ISA bus. This delay takes place because the PCI bus is much faster than the ISA bus. These two fields let you add recovery time (in bus clock cycles) for 16-bit and 8-bit I/O.

Memory Hole at 15M-16M

You can reserve this area of system memory for the ISA adapter ROM. When this area is reserved, it cannot be cached.

DRAM Fast Leadoff

Select Enabled to shorten the leadoff cycles and optimize performance.

Passive Release

This selection will enable or disable the CPU to PCI bus accesses during passive release. When disabled, the arbiter only accepts another PCI master access to local DRAM.

Delayed Transaction

When enabled, this selection turns on compliance with the PCI specification version 2.1 in regards to embedded 32-bit posted write buffer to support delay transaction cycles. The default setting is Disabled.

Power Management Setup

The Power Management Setup option controls the power management functions of the system. To access the POWER MANAGEMENT SETUP screen, highlight this option on the main menu screen and press <Enter>.
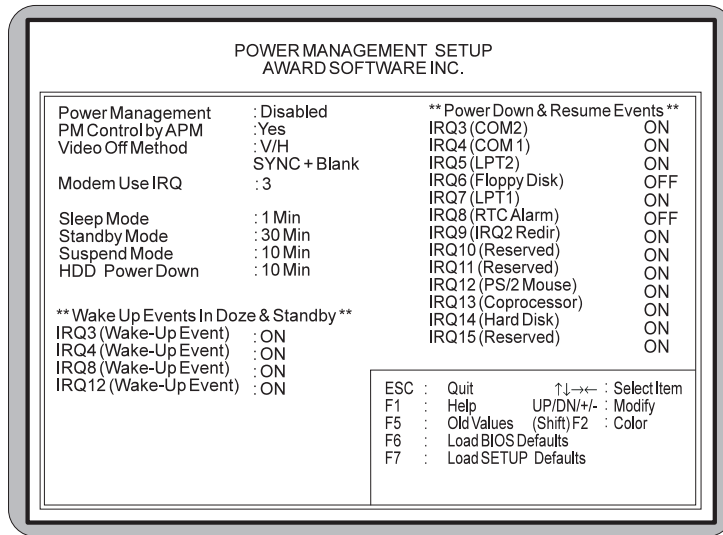
```
                POWER MANAGEMENT  SETUP
                   AWARD SOFTWARE INC.

   Power Management      : Disabled      ** Power Down & Resume Events **
   PM Control by APM     : Yes           IRQ3 (COM2)              ON
   Video Off Method      : V/H           IRQ4 (COM 1)            ON
                         SYNC + Blank    IRQ5 (LPT2)             ON
   Modem Use IRQ         : 3             IRQ6 (Floppy Disk)      OFF
                                         IRQ7 (LPT1)             ON
   Sleep Mode            : 1 Min         IRQ8 (RTC Alarm)        OFF
   Standby Mode          : 30 Min        IRQ9 (IRQ2 Redir)       ON
   Suspend Mode          : 10 Min        IRQ10 (Reserved)        ON
   HDD  Power Down       : 10 Min        IRQ11 (Reserved)        ON
                                         IRQ12 (PS/2 Mouse)      ON
                                         IRQ13 (Coprocessor)     ON
   ** Wake Up Events In Doze & Standby ** IRQ14 (Hard Disk)      ON
   IRQ3 (Wake-Up Event)   : ON          IRQ15 (Reserved)         ON
   IRQ4 (Wake-Up Event)   : ON
   IRQ8 (Wake-Up Event)   : ON   ┌─────────────────────────────────────┐
   IRQ12 (Wake-Up Event)  : ON   │ ESC  :  Quit        ↑↓→← : Select Item│
                                 │ F1   :  Help     UP/DN/+/- : Modify   │
                                 │ F5   :  Old Values  (Shift) F2 : Color│
                                 │ F6   :  Load BIOS Defaults            │
                                 │ F7   :  Load SETUP  Defaults          │
                                 └─────────────────────────────────────┘
```

Figure 4-6: Power Management Screen

Power Management

This selection allows you to select the type (or degree) of power saving for Doze, Standby and Suspend modes. See the section *PM Timers* for a brief description of each mode. The following table describes each power management mode:

Max Saving	Maximum power savings. Inactivity period is 1 minute in each mode.
User Define	Set each mode individually. Select time-out periods in the PM Timers section.
Min Saving	Minimum power savings. Inactivity period is 1 hour in each mode (except the hard drive).

PM Control By APM

When enabled, power management is controlled by the Advanced Power Management (APM) feature, which gives better power savings. The default setting is Yes.

Video OFF Method

This selection defines the video off method in standby mode. The following table describes each option:

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

Modem Use IRQ

Name the interrupt request (IRQ) line assigned to the modem (if any) on your system. Activity of the selected IRQ always awakens the system.

PM Timers

The following modes are Green PC power saving functions. They are user-configurable only during User Defined Power Management mode:

Sleep Mode

After the selected period of system inactivity (1 minute to 1 hour), the CPU clock runs at slower speed while all other devices still operate at full speed.

Standby Mode

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

Suspend Mode

After the selected period of system inactivity (1 minute to 1 hour), all devices except the CPU shut off.

HDD Power Down

After the selected period of drive inactivity (1 to 15 minutes), the hard disk drive powers down while all other devices remain active.

Wake-Up Events

You can turn On or Off monitoring of four commonly used interrupt requests so they do not awaken the system from, or reset activity timers for, Doze and Standby modes.

For example, if you have a modem on IRQ3, you can turn On IRQ3 as a wake-up event, so an interrupt from the modem can wake up the system. Or you may wish to turn Off IRQ12 (the PS/2) mouse as a wake-up event, so accidentally brushing the mouse does not awaken the system. The default wake-up event is keyboard activity.

Power Down and Resume Events

You can disable monitoring of common interrupt requests so they do not awaken the system from, or reset activity timers for Suspend mode.

PnP/PCI Configuration Setup

The PnP/PCI Configuration Setup option sets the various system functions and internal addresses of PnP and PCI devices and onboard PCI IDE controller. To access the PnP/PCI CONFIGURATION SETUP screen, highlight this option on the main menu screen and press <Enter>.
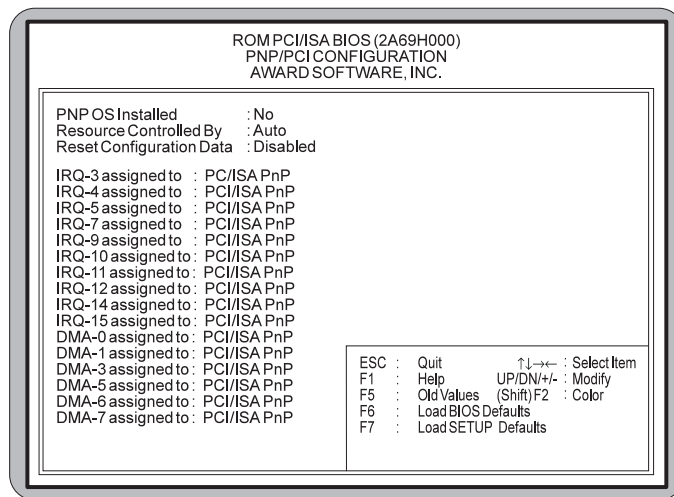
```
                    ROM PCI/ISA BIOS (2A69H000)
                      PNP/PCI CONFIGURATION
                        AWARD SOFTWARE, INC.

PNP OS Installed         : No
Resource Controlled By   : Auto
Reset Configuration Data : Disabled

IRQ-3 assigned to   :  PC/ISA PnP
IRQ-4 assigned to   :  PCI/ISA PnP
IRQ-5 assigned to   :  PCI/ISA PnP
IRQ-7 assigned to   :  PCI/ISA PnP
IRQ-9 assigned to   :  PCI/ISA PnP
IRQ-10 assigned to  :  PCI/ISA PnP
IRQ-11 assigned to  :  PCI/ISA PnP
IRQ-12 assigned to  :  PCI/ISA PnP
IRQ-14 assigned to  :  PCI/ISA PnP
IRQ-15 assigned to  :  PCI/ISA PnP
DMA-0 assigned to   :  PCI/ISA PnP
DMA-1 assigned to   :  PCI/ISA PnP        ESC :  Quit        ↑↓→←  : Select Item
DMA-3 assigned to   :  PCI/ISA PnP        F1  :  Help      UP/DN/+/- : Modify
DMA-5 assigned to   :  PCI/ISA PnP        F5  :  Old Values  (Shift)F2 : Color
DMA-6 assigned to   :  PCI/ISA PnP        F6  :  Load BIOS Defaults
DMA-7 assigned to   :  PCI/ISA PnP        F7  :  Load SETUP Defaults
```

Figure 4-7: PnP/PCI Configuration Screen

PnP OS Installed

When set to Yes, this selection allows the system to work with a Plug and Play (PnP) operating system such as Windows 95. The PnP BIOS will configure only PCI and ISA Plug and Play cards needed to boot the system, and allow the operating system or device drivers to configure the remaining cards. The default setting is No.

Resources Controlled By

The Stingray Plug and Play BIOS can automatically configure all the boot and Plug and Play-compatible devices. If you select Auto, all the interrupt request (IRQ) and

DMA assignment fields disappear, as the BIOS automatically assigns them.

Reset Configuration Data

Select Enabled to reset Extended System Configuration Data (ESCD) when you exit Setup. This selection allows the PnP BIOS to detect your PCI and ISA PnP devices and reallocate resources to them. The default setting is Disabled.

IRQ *n* Assigned To

When resources are controlled manually, assign each system interrupt as one of the following types, depending on the type of device using the interrupt:

Legacy ISA Devices compliant with the original PC AT bus specification, requiring a specific interrupt (such as IRQ4 for COM 1) or older ISA cards that use jumpers to adjust resources.

PCI/ISA PnP Devices compliant with the Plug and Play standard, whether designed for PCI or ISA bus architecture.

DMA *n* Assigned To

When resources are controlled manually, assign each system DMA channel as one of the following types, depending on the type of device using the interrupt:

Legacy ISA Devices compliant with the original PC AT bus specification, requiring a specific DMA channel or older ISA cards that use jumpers to adjust resources.

PCI/ISA PnP Devices compliant with the Plug and Play standard, whether designed for PCI or ISA bus architecture.

Load BIOS Defaults

This selection loads the BIOS default values that would allow safe booting of the system in the event of a BIOS configuration memory loss. To select LOAD BIOS DEFAULTS, highlight this option on the main menu screen and press <Enter>. Press <Y> or <N> when the program prompts you with the Load BIOS Defaults question.

Load Setup Defaults

This selection allows automatic configuration of all the options in the Standard CMOS Setup, BIOS Features Setup and Chipset Features Setup with the setup defaults. If problems are encountered after loading the setup defaults, reboot the system and load the BIOS defaults. To select LOAD SETUP DEFAULTS, highlight this option on the main menu screen and press <Enter>. Press <Y> or <N> when the program prompts you with the Load Setup Defaults question.

Integrated Peripherals

This option sets the addresses of I/O subsystems that depend on the integrated peripherals controller in your system. To access the INTEGRATED PERIPHERALS screen, highlight this option on the main menu screen and press <Enter>.
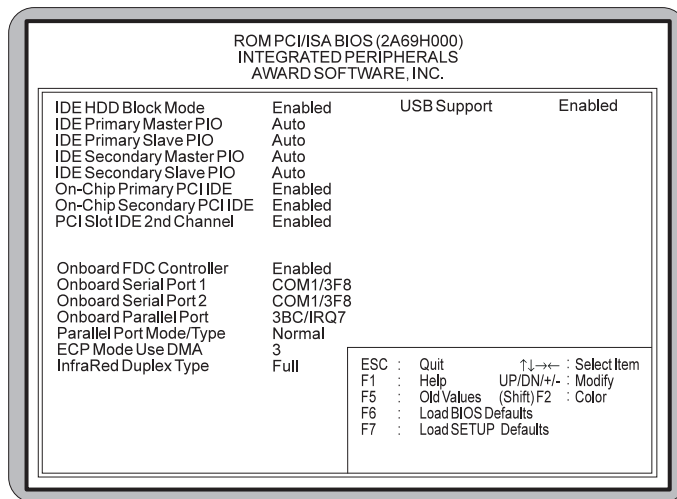
```
                    ROM PCI/ISA BIOS (2A69H000)
                      INTEGRATED PERIPHERALS
                       AWARD SOFTWARE, INC.

    IDE HDD Block Mode         Enabled      USB Support        Enabled
    IDE Primary Master PIO     Auto
    IDE Primary Slave PIO      Auto
    IDE Secondary Master PIO   Auto
    IDE Secondary Slave PIO    Auto
    On-Chip Primary PCI IDE    Enabled
    On-Chip Secondary PCI IDE  Enabled
    PCI Slot IDE 2nd Channel   Enabled


    Onboard FDC Controller     Enabled
    Onboard Serial Port 1      COM1/3F8
    Onboard Serial Port 2      COM1/3F8
    Onboard Parallel Port      3BC/IRQ7
    Parallel Port Mode/Type    Normal
    ECP Mode Use DMA           3         ESC  :  Quit          ↑↓→←  : Select Item
    InfraRed Duplex Type       Full      F1   :  Help          UP/DN/+/-  : Modify
                                         F5   :  Old Values   (Shift) F2  : Color
                                         F6   :  Load BIOS Defaults
                                         F7   :  Load SETUP  Defaults
```

Figure 4-8: Integrated Peripherals Configuration Screen

IDE HDD Block Mode

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

IDE Primary/Secondary Master/Slave PIO

The four IDE PIO (Programmed Input/Output) fields allow you to set a PIO mode (0-4) for each of the four IDE

devices that the onboard IDE interface supports. Modes 0 through 4 provide successively increased performance. In Auto (default) mode, the system automatically determines the best mode for each device.

On-Chip Primary/Secondary PCI IDE

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

PCI Slot IDE 2nd Channel

You may separately disable the second channel on an IDE interface installed in a PCI expansion slot.

Onboard FDC Controller

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

Onboard Serial Port 1/Serial Port 2

Select a logical COM port name and matching address for the first and second serial ports.

Onboard Parallel Port

Select an address and interrupt for the physical parallel (printer) port.

Parallel Port Mode/Type

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

ECP Mode Use DMA

Select a DMA channel for the parallel port when using ECP (Expanded Capabilities Port) mode.

Infrared Duplex Type

Select the value required by the IR device connected to the IR port. Full Duplex Mode (default) permits simultaneous two-direction transmission. Half Duplex Mode permits transmission in one direction at a time.

USB Support

Select Enabled (default) if your system contains a Universal Serial Bus (USB) controller and you have USB peripherals.

Supervisor Password

The Supervisor Password utility allows you to setup, change or disable the password stored in the BIOS. The Supervisor Password allows access to the system and Setup. To setup or change a password, highlight the SUPERVISOR PASSWORD option on the main menu screen and press <Enter>.

The password can be no more than eight characters long. The program will prompt you to confirm the new password before exiting and enabling the utility. To disable the password, press <Enter> when the program prompts you to enter the new password.

WARNING: If you forget the Supervisor Password, it cannot be disabled without resetting the CMOS.

User Password

The User Password utility allows you to setup, change or disable the password stored in the BIOS. Follow the same procedure used to setup the Supervisor Password. The User Password allows access to the system, but will not allow you to modify the CMOS settings.

IDE HDD Auto Detection

The IDE HDD Auto Detection option provides auto configuration of the hard drive installed in your system. To access the IDE HDD Auto Detection screen, highlight this option on the main menu screen and press <Enter>.
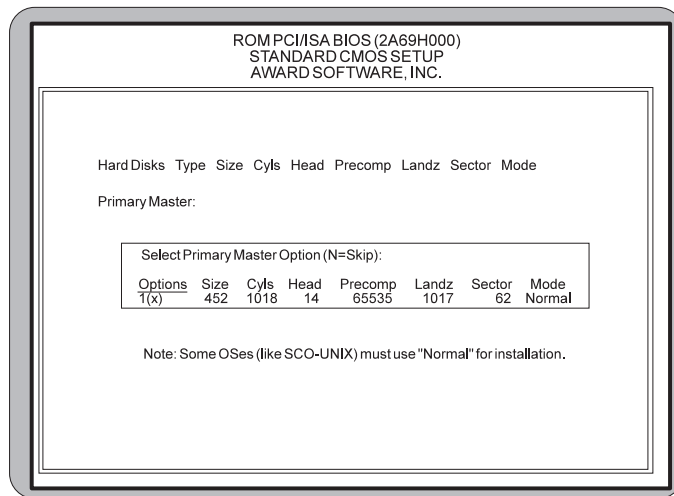
```
                ROM PCI/ISA BIOS (2A69H000)
                  STANDARD CMOS SETUP
                   AWARD SOFTWARE, INC.


   Hard Disks  Type  Size  Cyls  Head  Precomp  Landz  Sector  Mode

   Primary Master:


     Select Primary Master Option (N=Skip):

     Options   Size   Cyls   Head   Precomp   Landz   Sector   Mode
     1(x)       452   1018     14     65535    1017       62   Normal


     Note: Some OSes (like SCO-UNIX) must use "Normal" for installation.
```

Figure 4-9: IDE HDD Auto Detection Screen

The IDE HDD Auto Detection option provides auto configuration of the hard drive installed in your system. It supports LBA, Large and Normal modes.

If your hard disk drive's capacity is under 528MB, select Normal mode. NOTE: It is recommended that you select Normal mode for your hard disk drive if you will be using UNIX. If the system's hard disk drive has a capacity of over 528MB and supports LBA functions, you may enable either the LBA mode or the Large Mode.

HDD Low Level Format

Micronics recommends that only trained technicians use this utility. This selection allows you to perform a low level format of your hard disk drive. To select the HDD LOW LEVEL FORMAT option, highlight this option on the main menu screen and press <Enter>.
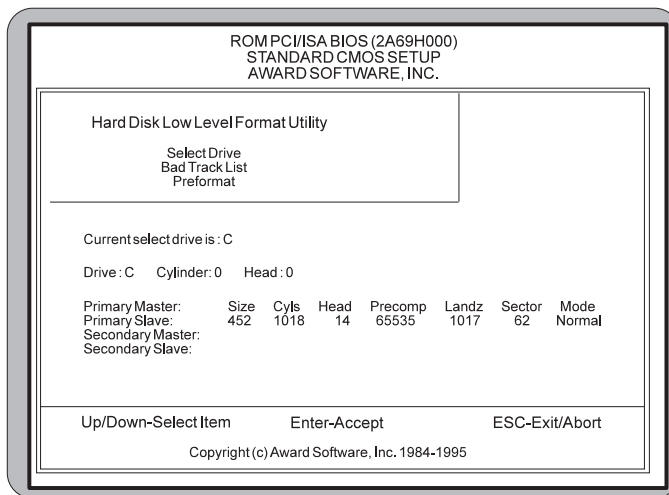
```
                    ROM PCI/ISA BIOS (2A69H000)
                       STANDARD CMOS SETUP
                        AWARD SOFTWARE, INC.

    Hard Disk Low Level Format Utility

              Select Drive
             Bad Track List
               Preformat


    Current select drive is : C

    Drive : C     Cylinder: 0      Head : 0

    Primary Master:        Size   Cyls   Head   Precomp   Landz   Sector   Mode
    Primary Slave:         452    1018    14     65535     1017     62     Normal
    Secondary Master:
    Secondary Slave:



    Up/Down-Select Item         Enter-Accept            ESC-Exit/Abort
              Copyright (c) Award Software, Inc. 1984-1995
```

Figure 4:10: HDD Low Level Format Screen

The selections available are: Low Level Format Utility, Select Drive Bad Track List and Preformat.

Save and Exit Setup

This selection saves the changes you have made in the setup program, then exits and reboots the system. After making all modifications in the setup program, exit to the main menu screen. Highlight the SAVE AND EXIT SETUP option and press <Enter>. Press <Y> to confirm the changes made and <N> or <ESC> if additional modifications are needed before exiting the setup program.

Exit Without Saving

This selection abandons all previous settings, then exits and reboots the system. From the main menu screen highlight the EXIT WITHOUT SAVING option and press <Enter>. Press <Y> and the system will exit the setup program, then reboot without saving any of the changes made.

Appendix

A

Specifications

Part Number:	09-00311
Processor:	Single Intel Slot 1® Intel Pentium® II - 233/266/300MHz Integrated Voltage Regulator Module
Chipset:	Intel 440FX PCI chipset Intel PIIX 3 SMC FDC37C932 Ultra I/O chip
CPU Clock Select:	Support for 66MHz CPU bus speed configurations.
Form Factor:	ATX form factor
Expansion:	Four 32-bit PCI slots Four 16-bit ISA slots One is a shared PCI/ISA slot
BIOS:	Award BIOS w/ 1MB Flash PCI auto configuration APM 1.2 Auto-detection of memory size Auto-detection and display of ECC and EDO memory. Auto-configuration of IDE disk drives Soft Power Down Multi-boot II DMI
Memory :	Maximum Memory - 1 GByte Four 72-pin SIMM sockets Two 3.3V unbuffered 168-pin DIMM sockets. Supports FPM and EDO memory ECC supported via chipset

Keyboard/Mouse: PS/2 style keyboard and mouse connectors

Cache: 256 or 512K Pipelined Burst Level 2 cache in
                  CPU package.

I/O Ports: Two high speed serial ports (16550 compatible)
                  Enhanced 25-pin parallel port w/ EPP and ECP
                  IrDA compliant IR header
                  Two USB ports via cable w/ bracket

Floppy Port: Supports two floppy drives
                  (2.88MB, 1.44MB, 1.2MB, 720KB, 360KB).

PCI IDE Ports: Two 40-pin IDE connectors
                  (Primary and Secondary IDE).
                  Multiple sector transfer support
                  Auto detection of add-in IDE board

Environmental Specifications

The environment in which the Stingray is located is critical.
Micronics recommends the following environmental specifications:

Temperature Range

Operating: 50 to 104 degrees Fahrenheit (10 to 40 degrees Celsius).
Non -Operating: 50 to 140 degrees Fahrenheit (10 to 60 degrees
Celsius). Shipping: -22 to 140 degrees Fahrenheit (-30 to 60 degrees
Celsius).

Relative Humidity

Operating: 20% to 80%.
Non-Operating: 5% to 90%.

Battery Disposal

F1 - KB FUSE
Rating: 5VDC at 5A
*For recommended replacement part,
contact Micronics RMA Dept.
(510) 683-0428

CAUTION
Danger of explosion if battery is incorrectly replaced.
Replace only with the same or equivilent type
recommended by the manufacturer. Discard used
batteries according to the manufacturer's instructions.

ATTENTION
IL Y A DANGER D'EXPLOSION S'IL Y A REMPLACEMENT
INCORRECT DE LA BATTERIE. REMPLACER UNIQUEMENT
AVEC UNE BATTERIE DU MEME TYPE OU D'UN TYPE
RECOMMANDE PAR LE CONSTRUCTEUR. METTRE AU
REBUT LES BATTERIES USAGEES CONFORMEMENT AUX
INSTRUCTIONS DU FABRICANT.

WARNING:

Please do not open battery, dispose of in fire, recharge, put in backwards or mix with used or other battery types. The battery may explode or leak and cause personal injury.

Support and Information Services

Micronics offers a variety of support and information services to help you get the most from your product. The following services are available:

▲ Technical Support

▲ Electronic Bulletin Board Service (BBS)

▲ Return Materials Authorization (RMA)

▲ Fax-On-Demand

▲ World Wide Web

▲ Customer Service

Refer to Table A-1 for details on these services.

Technical Support

If you need technical assistance, our Technical Support Engineers will be glad to help you. You can contact us via telephone, fax or BBS. Before calling Technical Support please have the following information ready:

❏ The model name and 09 part number of your Micronics product, which is silk screened on the face of the Stingray system board.

❏ Your computer information such as CPU type, operating system, amount of installed memory and other peripherals installed in your computer.

❏ Try to call from the location of your computer.

NOTE: For Return Material Authorization purposes, please keep a copy of your product receipt.

Service	Hours	Country	Telephone Number
Technical Support - Live phone help from Technical Support Engineers	M-F: 7:00am to 5:00pm (PST)	USA	(510) 661-3000 (510) 651-6982 (Fax)
		France	+33 (1) 45 43 56 26 +33 (1) 45 43 17 78 (Fax)
		UK	+44 (1256) 844899 +44 (1256) 364222 (Fax)
Electronic Bulletin Board Service (BBS) - Information on software upgrades, new releases and other helpful information	24 hours a day 7 days a week	USA	(510) 651-6837 14400 baud rate, Parity=N, Data Bits=8, Stop Bits=1 YMODEM and ZMODEM (recommended file transfer protocols)
	"	UK	+44 (1256) 363373
RMA (Return Materials Authorization) - Return products for repair	M-F: 8:00am to 4:45pm (PST)	USA	(510) 661-3030 (510) 683-0543 (Fax)
Fax-On-Demand - Automated system for product literature, technical bulletins and other helpful information	24 hours a day 7 days a week	USA	(510) 661-3199
World Wide Web - Product information, technical support, press releases and other helpful information	24 hours a day 7 days a week	USA	http://www.micronics.com
	"	Europe	http://www.mcrni.com
Customer Service - Order Micronics and Orchid products	M-F: 8:00am to 5:00pm (PST)	USA	(800) 577-0977 (510) 651-3666 (Fax)
		France	+33 (1) 45 43 56 26 +33 (1) 45 43 17 78 (Fax)
		UK	+44 (1256) 479 898 +44 (1256) 364222 (Fax)
		Germany	+49 (89) 58 09 82 55 +49 (89) 58 09 82 25 (Fax)
		Taiwan	+886 2 918 5005 +886 2 911 5472 (Fax)

Table A-1: Support and Information Services

Appendix

B

POST Messages

During the Power-On Self Test (POST), the BIOS either sounds a beep code or displays a message when it detects a correctable error. Currently the only beep code indicates that a video error has occurred and the BIOS cannot initialize the video screen to display any additional information. The beep code consists of a single long beep followed by two short beeps.

Message	Possible Cause	Solution
BIOS ROM CHECKSUM ERROR - SYSTEM HALTED	The checksum of the BIOS code in the BIOS chip is incorrect, indicating the BIOS code may have become corrupt.	Requires a BIOS replacement.
CMOS BATTERY FAILED	CMOS battery is no longer functional.	Requires a battery replacement.
CMOS CHECKSUM ERROR-DEFAULTS LOADED	Checksum of CMOS is incorrect, so the system loads the default equipment configuration.	This error may have been caused by a weak battery. Check the battery and replace if necessary.
DISKETTE DRIVES OR TYPES MISMATCH ERROR	Type of diskette drive installed in the system is different from the CMOS configuration.	Run Setup to reconfigure the drive type correctly.
DISPLAY SWITCH IS SET INCORRECTLY	The display switch on the system board can be set to either monochrome or color. This message indicates the switch is set to a different setting than indicated in Setup.	Determine which setting is correct. Then either turn off the system and change the jumper, or enter Setup and change the Video selection.
KEYBOARD ERROR OR NO KEYBOARD PRESENT	Cannot initialize the keyboard.	Make sure the keyboard is attached correctly and no keys are pressed during POST. Check the Halt On configuration in Setup. May require replacement of keyboard.

Message	Possible Cause	Solution
KEYBOARD IS LOCKED OUT - UNLOCK THE KEY	This message usually indicates that one or more keys have been pressed during the keyboard tests.	Be sure no objects are resting on the keyboard.
FLOPPY DISK(s) FAILED	Cannot find or initialize the floppy drive controller or the drive.	Make sure the controller is installed correctly. If no floppy drives are installed, be sure the Diskette Drive selection in Setup is set to None or Auto.
HARD DISK INSTALL FAILURE	Cannot find or initialize the hard drive controller or the drive.	Make sure the controller is installed correctly. If no hard drives are installed, be sure the Hard Drive selection in Setup is set to None.
HARD DISK(s) DIAGNOSTICS FAILED	The system may run specific disk diagnostic routines. This message appears if one or more hard disks return an error when running the diagnostics.	Rerun Setup and check connections. May require a hard disk replacement.
PRIMARY MASTER HARD DISK FAILED	POST detects an error in the primary master IDE hard drive.	May require a replacement of the primary master hard disk.
PRIMARY SLAVE HARD DISK FAILED	POST detects an error in the secondary master IDE hard drive.	May require a replacement of the secondary master hard disk.
SECONDARY MASTER HARD DISK FAILED	POST detects an error in the primary slave IDE hard drive.	May require a replacement of the primary hard disk.
SECONDARY MASTER HARD DISK FAILED	POST detects an error in the secondary slave IDE hard drive.	May require a replacement of the secondary slave hard disk.

Message	Possible Cause	Solution
MEMORY TEST FAILED	If POST detects an error during memory testing, additional information appears giving specifics about the type and location of the memory error.	May require replacement of defective memory.
MEMORY PARITY ERROR AT........	Indicates a memory parity error at a specific location.	You can use this location along with the memory map for your system to find and replace the defective memory chips.
PRESS F1 TO DISABLE NMI, F2 TO REBOOT	The BIOS detected a nonmaskable Interrupt condition during boot.	Reboot the system with the NMI enabled.
OVERRIDE ENABLED - DEFAULTS LOADED	If the system cannot boot using the current CMOS configuration, the BIOS can override the current configuration.	The BIOS contains a set of defaults designed for the most stable, minimal-performance system operations.

Appendix

C

Updating the System BIOS

The Micronics system boards are designed so that the BIOS can be reprogrammed using a BIOS file. You can easily FLASH a BIOS by following the steps below:

1) After downloading the appropriate BIOS file from our BBS or Website, extract it to a bootable MS-DOS 6.X or Windows 95 diskette.

2) If you are using MS-DOS 6.X, reboot your system with the bootable diskette in the A: drive. To make sure a clean DOS environment is loaded, press the F5 key while "Starting MS-DOS" is displayed. After the system has rebooted, the cursor will appear at the A:\> prompt.

3) If you are using Windows 95, press F8 when you see "Starting MS Windows 95." Select the option "Safe Mode Command Prompt."

4) Now you can run the FLASH utility from the A:\> prompt. For example, to update the Stingray to BIOS version XX, you would type:

A:\> AWDFLASH STNGRYXX.BIN   [ENTER]

If you encounter any problems during this process, or if you have questions about the procedure, please call Technical Support.

5) After the FLASH screen appears, select [Y]es to save the current BIOS or [N]o if you do not want to save the current BIOS. NOTE: It is recommended that you save the current BIOS.

6) When prompted, select [Y]es to reprogram the BIOS.

7) After the update process has completed, you will be prompted to power off or reset your system. Once the system reboots, verify that the new BIOS version appears on the screen. NOTE: After reprogramming the BIOS, you may need to enter Setup and reset your settings.

NOTE: If the BIOS is somehow erased or does not seem to accept the upgrade, you can purchase a new BIOS from MicroNiche Information Systems (800-733-9188). There is a $30.00 fee plus shipping charges for this service. (Price and availability subject to change.)

If you prefer to send your system board in for the upgrade, the Micronics RMA department offers this service free of charge if your system board is under warranty.

Appendix

D

Limited Warranty

Except as described below, Micronics warrants the products to be free from defects in material and workmanship in normal use for a period of one (1) year from date of purchase. Should any product fail to perform according to this warranty at any time during the warranty period, except as provided below, Micronics or its authorized service centers will, at Micronics' option, repair or replace the product at no additional charge.

The warranty does not cover loss or damage which occurs in shipment or which is due to: (1) improper installation or maintenance, misuse, neglect or any cause other than ordinary commercial application, including without limitation, accidents or acts of God; (2) adjustment, repair, or modification by other than a Micronics authorized service center; (3) improper environment, excessive or inadequate heating or air conditioning, or electrical power failures, surges or other irregularities; (4) any statement about the product other than those set forth in this warranty; or (5) nonconformity to models or samples shown to the purchaser. Any models or samples were for the sole purpose of suggesting the character of the product and are not intended to form the basis of the bargain.

A receipt or copy of the invoice with the date of purchase from a Micronics reseller is required before any warranty service can be rendered. Service can be obtained by calling Micronics for a Return Merchandise Authorization (RMA) Number.

The RMA Number should be prominently displayed on the outside of the shipping carton of the returned product. Returned product should be shipped prepaid or hand carried to Micronics. The purchaser assumes risk of loss or damage in transit, and unless otherwise agreed to in writing by Micronics, will pay inbound shipping charges.

The exclusive remedy of the purchaser under this warranty above will be repair or replace at Micronics' option,

but if for any reason that remedy should fail of its essential purpose, the exclusive remedy of the purchaser shall then be actual damages up to amounts paid for the defective product by the purchaser. This limited warranty shall be deemed to "fail of its essential purpose" if, after repeated efforts, Micronics is unable to make the product operate as warranted. Micronics' liability for damages to the purchaser for any cause whatsoever; regardless of the form of action and whether in contract or in tort, shall be limited to the purchase price in effect when the cause of action arose for the product that is the basis of the claim.

Micronics will not be liable for any lost profits or any indirect, special incidental or consequential damages in connection with the product, even if Micronics has been advised of the possibility of such damages.

Micronics makes no warranties or representations as to performance of products or as to service to distributor or to any person, except as set forth in Micronics; limited warranty accompanying delivery of product.

Micronics disclaims all other warranties whether oral, written, expressed, or implied, including without limitation, the warranties of design, merchantability, or fitness for a particular purpose, if applicable, or arising from a course of dealing, usage or trade practice.

Non-Warranty Service

After the one year warranty service is no longer in effect, repair service is still available for Micronics products. For more information, contact Micronics' RMA department at (510) 661-3030. The RMA department is open between 8:30 A.M. and 4:45P.M. Pacific Standard Time.

FCC Statement

This equipment has been tested and found to comply within the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not used in accordance with the instructions, may cause harmful interference to radio communications. Interference to radio or television reception can be determined by turning the equipment off and on. You are encouraged to try to correct the interference by one or more of the following measures:

▲　　Reorient the receiving antenna.

▲　　Increase the separation between the equipment and the receiver.

▲　　Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

▲　　Consult your dealer or an experienced radio/TV technician for help.

To meet FCC requirements, shielded cables are required.

NOTE: Changes or modifications not expressly approved by Micronics could void your authority to operate the equipment.

Glossary

16550 UART - A high speed chip for controlling serial ports. Although unnecessary for a mouse, it is required for modems that are 14,400 baud or faster.

APM - An acronym for Advanced Power Management. The APM specification defines a layer of software that supports power management in computers with power manageable hardware.

Asynchronous - Operations that do not require the clocks of communicating devices to be coordinated. See Synchronous.

ATX - A system board size measuring approximately 12" x 9.6".

Bidirectional Parallel Port - A type of parallel port that can send and receive information.

BIOS - An Acronym for Basic Input/ Output System. Configures the system board and provides hardware information to the operating system.

Bit - A contraction of Binary digit. The smallest unit of information in a binary number system. A bit represents a choice between either zero or one.

Boot - To start up the computer and load the operating system software. See cold boot and warm boot.

Buffered DIMMs - The 168-pin buffered DIMM modules use buffer logic chips on their control lines to reduce loading on the system board. This buff-

ering action increases the maximum number of modules on the same system board. The buffered DIMMs come with standard DRAM chips for either 5V or 3.3V operation.

Bus - A group of electronic paths used to send data between parts of the system. On a system board, the bus connects the peripheral cards with the microprocessor via the expansion slots.

Bus Mastering - The ability of a peripheral card to control the bus without requiring intervention of the CPU.

Byte - A group of adjacent bits treated as a unit. Eight bits are typically considered one byte. Also called a character.

Cache - A process where information is copied from the slower memory (DRAM) to the faster memory (SRAM). Information that is likely to be read or edited is stored in the cache providing significant performance increases.

Cache Hit - The percentage of request for data from memory that can be served from the cache.

Cache Miss - A memory access which cannot be supplied from cache.

Cold Boot - Starting the computer by turning on the power or pressing the RESET button. A cold boot makes the processor execute all of the diagnostics. See boot and warm boot.

CPU - An acronym for Central Processing Unit. A CPU performs arithmetic calculations, makes logical decisions, and directs the operation of the computer in conjunction with the operating system.

DIMM - An acronym for Dual Inline Memory Module. A small printed circuit board containing memory chips.

Disk Drive - A hardware device which provides for the storage of data on diskettes or hard metal disks that have a magnetic coating. A disk drive functions by spinning at high speed while moving a device called the read/write head across the disk's surface in order to read or write data in magnetic code.

DMI - An acronym for Desktop Management Interface. DMI makes hardware inventory easier. It defines a format of a management agent for desktop systems. Its layered-model architecture allows a wide range of software and hardware components to pass information about themselves to an asset management system.

DRAM - An acronym for Dynamic Random Access Memory. A type of memory chip that only keeps its memory if supplied with regular clock pulses and a chance to regularly refresh its data. It is slower and more cost effective than SRAM. See SRAM.

ECC - An acronym for Error Checking and Correction. ECC is logic designed to correct memory errors. The number of errors that can be corrected depends upon the algorithms used, and the number of error correction bits (non-data bits) present.

ECP - An acronym for Expanded Capabilities Port. A standard set by Hewlett Packard and Microsoft Corporation to expand the capabilities of the parallel port.

EDO Memory - An acronym for Extended Data Out. A DRAM performance feature that permits multiple bit of data in a single row to be accessed quickly.

EPP - An acronym for Enhanced Parallel Port. A standard which increases the capabilities of the parallel port.

EPROM - Acronym for Erasable Programmable Read Only Memory. A type of ROM chip that can be programmed with relatively simple tools that will retain its data until erased. It can only be erased by exposing the circuitry in the chip to ultraviolet light. See also Flash ROM.

Flash ROM - A type of ROM chip that will retain its data until erased. It can be erased or reprogrammed by supplying it with +12V of voltage. See ROM and EPROM.

FPM - An acronym for Fast Page Mode. A timing option that permits several bits of data in a single row on a DRAM to accessed at an accelerated rate.

Gigabyte - A disk storage capacity measurement. Approximately one thousand megabytes or 1,073,741,824 bytes.

IDE - An acronym for Integrated Device Electronics. A standard for communicating between a hard drive and a computer.

Internal Cache - Cache which is built into the CPU. See Cache.

ISA - An acronym for Industry Standard Architecture. A well-established bus standard that originated with the IBM AT. See *PCI and VESA Local Bus.*

NS - An acronym for Nanosecond. One billionth of a second. Measure of the access time of RAM.

Parallel - A form of data transmission in which the data is sent one byte at a time over several wires that each carry one byte. In parallel transmission, all the bytes arrive simultaneously, as opposed to serial transmission in which bits arrive one by one.

Parallel Port - A connection for a printer or similar peripheral. Generally, parallel ports are output only. See Bi-directional Parallel Port and ECP.

Parity - Logic that detects the presence of an error in memory. Generally, a single parity bit is used for each byte (8 bits) of data. The most commonly used forms of parity are even parity, odd parity and checksums.

PCI - An acronym for Peripheral Component Interconnect. A high performance 32-bit or 64-bit bus developed by Intel Corporation. PCI is designed to be independent of the

hardware architecture to ensure compatibility with future computer systems. See *VESA Local Bus and ISA.*

Pentium - A high performance 64-bit CISC processor designed and manufactured by Intel Corporation.

Pipeline - In DRAMs and SRAMs, a method for increasing the performance using multistage circuitry to stack or save data while new data is being accessed.

Plug and Play - A standard developed to ensure easy installation of peripherals. Theoretically, a newly installed card will automatically configure itself and work properly without requiring jumper configuration or device drivers.

POST - An acronym for Power On Self Test. A diagnostic program that is run whenever the system is cold booted.

RAM - An acronym for Random Access Memory. A type of memory that is used as the "working memory" of a computer system. See DRAM and SRAM.

ROM - An acronym for Read Only Memory. A type of memory that retains its data without requiring power. Once written, it cannot be modified. See EPROM and Flash ROM.

Serial Port - A communications port used to connect peripherals such as modems and mice.

Setup - A program that allows you to make changes to the system configuration.

Shadow RAM - A technique used to load a duplicate copy of BIOS from slower ROM into faster RAM. This enhances system performance because it provides higher access speed to the BIOS.

SIMM - An acronym for Standard Inline Memory Module. A small printed circuit board containing memory chips.

SRAM - An acronym for Static Random Access Memory. A type of memory that can retain data without requiring a regular clock signal. Although they are faster than DRAM, they hold less data and are more expensive.

Synchronous Cache - A type of cache that uses a clock signal to latch the inputs and the data output. This structure spreads the cache access across two or three cycles while maintaining a bandwidth of one access per cycle. Improves performance by 5-10%.

Unbuffered DIMMs - The unbuffered DIMM modules do not use any buffer logic chips, thus achieving faster operation due to the elimination of the propagation delay of the logic buffer. This increase in speed comes at the cost of reducing the maximum number of modules on the same system board.

USB - An acronym for Universal Serial Bus. The simple and flexible way to connect devices to your desktop or notebook PC. USB allows virtually unlimited PC expansion with no more hassles over add-in cards, dip switches, jumper cables, software drivers, IRQ settings, DMA channels and I/O addresses. With USB, you can attach and detach peripherals without opening the computer or even shutting it down.

VESA - An acronym for Video Electronics and Standards Association.

VESA Local Bus (VL-Bus) - A high performance bus designed by VESA. A 32-bit version of the ISA bus which operates at the speed of the computer's CPU. See *PCI and ISA*.

VRM - Voltage Regulator Module. Supplies CPU specific voltages for the Secondary CPU.

Warm Boot - Restarting the system by simultaneously pressing the <Ctrl>, <Alt> and <Delete> keys.

Write-Back Cache - Upon a cache hit, the cache is updated and the main memory is not affected. Upon a cache miss, only the main memory is updated.

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