Dual Fortress
Pentium II
System Board Manual

MICR⊕NICS

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Introduction

Thank you for choosing the Dual Fortress system board. The Dual Fortress is the highest performing advanced dual processor solution for the industry's most demanding workstation and server applications.

Based on the Intel 440FX PCIset, the Dual Fortress 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, optional 16-bit Yamaha sound with wavetable synthesis, and up to 512K of Level 2 cache on the CPU make this board powerful and feature rich.

In addition, the Dual Fortress 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 Dual Fortress includes the following features:

▲ Dual Intel Slot 1®
Intel Pentium II® chip 233/266/300MHz
One integrated Voltage Regulator Module and one Voltage Regulator socket

▲ Intel 440FX PCIset
Intel PIIX 3
SMC FDC37C93X Ultra I/O chip

▲ 256K or 512K Level 2 Cache in CPU package

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

▲ Four 3.3V unbuffered 64-bit DIMM sockets
Maximum memory 1GB
Supports FPM, EDO and BEDO DRAM memory
ECC support via chipset

▲ Yamaha OPL3 and OPL4 (optional)

▲ Hardware Management - LM78 microprocessor system hardware monitor

▲ ATX form factor

Software Compatibility

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

▲ Microsoft
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 3.12
Novell Netware 4.11

Before You Begin

This manual will familiarize you with the features, installation and use of your Dual Fortress. 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 Dual Fortress

STATIC!
Before handling the Dual Fortress, be properly grounded by using a special wrist or ankle strap, or touch a safely grounded object.

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 Dual Fortress 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 3.

6. Install the system board in the chassis and make all necessary case connections.

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.

10. Set the time and date. Adjust the BIOS settings to match your configuration. If installing an IDE drive, select the IDE device you wish to configure. Press ENTER with Autotype Fixed Disk selected and the BIOS will automatically configure the drive for you (refer to Chapter 4).

```
PhoenixBIOS  Version 4.0 Release 6.0
Copyright  1985-1997 Phoenix Technologies Ltd., All Rights Reserved

Micronics Computers, Inc.          Dual Fortress-xxx

CPU=Pentium II  xxx
xxxxkb Cache SRAM Passed
xxxx640K System RAM Passed
xxxxxxxK Extended RAM Passed
"memory type" Detected

System BIOS Shadowed and Cached
Video BIOS Shadowed and Cached


PS/2 Mouse Initialized



Press <F2> to enter SETUP
```

Figure 1.1: Power-Up Screen

11. After you have configured the Main Setup menu, make any desired setting configurations in the Advanced and Security menu. When finished, go to the exit screen, select "Save Changes and Exit" and you are finished with the BIOS configuration (see Chapter 4).

12. Install the sound device drivers (optional). Refer to Chapter 5.

Chapter

2

Configuring the Dual Fortress

Although the Dual Fortress 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 Dual Fortress 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 Dual Fortress board via one of the solder pads that surround its mounting holes. When you remove the Dual Fortress 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.

Dual Fortress System Board
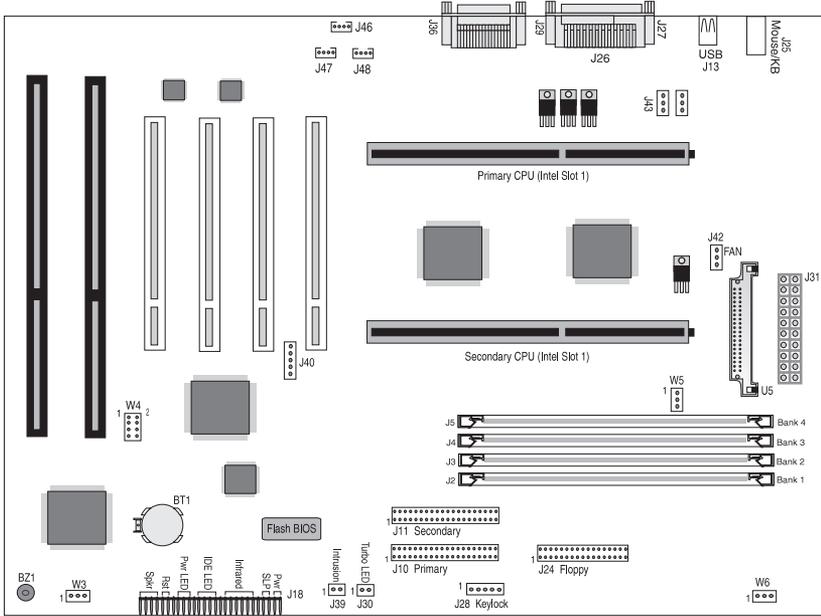
Figure 2-1. Dual Fortress System Board Diagram

Jumper Settings

This section provides the jumper settings for the Dual Fortress system board.

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

CPU Speed	Bus Speed	Jumper W4				Jumper W5
		1-2	3-4	5-6	7-8	1-2
233MHz	66 x 3.5	Close	Close	Open	Open	1-2
266MHz	66 x 4.0	Close	Open	Close	Open	1-2
300MHz	66 x 4.5	Close	Open	Close	Open	1-2
333MHz	66 x 5.0	Close	Open	Open	Close	1-2

Table 2-1: System Speed Selection

Table 2-2 lists the settings to clear the CMOS. 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
W3	Normal (default) Clear CMOS	1-2 2-3

Table 2-2: Clear CMOS Settings

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

Connector	Function	Notes
J2-J5	DIMM Sockets	
J10	Primary IDE Port	
J11	Secondary IDE Port	
J13	USB Connector	Port 0 Port 1
J18	Front Panel	
"	Speaker	24 - +5V; 25 - Key; 26 - Speaker Data Connect; 27 - PC Speaker Output
"	Reset Switch	22 - Ground; 23 - FP_Reset
"	Power LED	18 - Ground; 19 - Key; 20 - Power_DRV
"	Hard Drive LED	13 - +5V; 14 - Key; 15 - HDD Active; 16 - +5V
"	Infrared (IR)	6 - +5V; 7 - Key; 8 - Receive Data; 9 - Ground; 10 - Transmit Data; 11 - No connect
"	Sleep Switch	3 - Sleep_REQ; 4 - FPSleep_Pwr
"	Soft Power Switch	1 - FPPwr; 2 - Switch On
J24	Floppy Drive Connector	
J25	Keyboard & Mouse	PS/2 style connectors
J26	Parallel Port Connector	Can be disabled at the CMOS configuration screen
J27	Serial Port (COM 1)	Can be disabled at the CMOS configuration screen

Table 2-3: Connector Settings and Functions

Connector	Function	Notes
J28	Keylock Switch	1 - Power; 2 - No Connect; 3 - Ground; 4 - Keyboard Lock; 5 - Ground
J29	Serial Port (COM 2)	Can be disabled at the CMOS configuration screen
J30	Turbo LED	
J31	ATX Power Connector	
J36	Game Port/MIDI MIC In Line In Line Out	Upper Level Lower Level Lower Level Lower Level
J39	Chassis Intrusion	
J40	External Temperature Sensor	1 - SMDATA; 2 - Ground; 3 - SMCLOCK; 4 - VCC; 5 - Board temperature interrupt
J44	Primary Intel Slot 1	
J45	Secondary Intel Slot 1	
J46	CD-ROM Audio In	1 - Audio In (R); 2 - Ground; 3 - Audio In (L); 4 - Ground
J47	Line In Connector	ATAPI
J48	Line Out Connector	ATAPI
U5	CPU VRM Connector	Secondary

Table 2-3a: Connector Settings and Functions

Chapter

3

Installing the Dual Fortress

Introduction

This chapter explains how to install the Dual Fortress 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 Dual Fortress is augmented by its support for EDO, BEDO and FPM DRAM memory and ECC. The Dual Fortress supports ECC (with 72-bit DIMMs) 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 Dual Fortress system board.

Installing the Dual Fortress

Installation of the Dual Fortress system board depends on the type of case you use. The Dual Fortress is designed for the 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 Dual Fortress:

❏ 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 Dual Fortress 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 Dual Fortress system board. The Dual Fortress has four 3.3V unbuffered 64/72-bit, 168-pin DIMM sockets for a maximum of 1GB of memory. Support is provided for EDO, BEDO and FPM DRAM memory. This section list the rules for adding memory to the Dual Fortress, 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. If you follow these rules, your upgrade should be trouble-free:

❏ Use 70ns or faster DIMMs.

❏ DIMM memory modules support FPM, EDO and BEDO (unbuffered) memory types.

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

❏ 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.

For long term reliability, Micronics recommends using DIMMs with gold-plated contacts. The use of tin-plated contacts may conflict with the gold alloy on the DIMM socket.

168-Pin DIMM

One bank   One bank
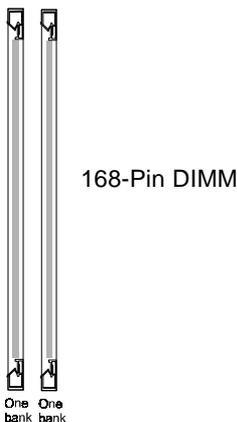
Memory Configurations

DIMM memory configuration is auto-banking and therefore does not need to be installed in any particular order. The following table lists the most common memory configurations.

Memory	DIMM 1	DIMM 2	DIMM 3	DIMM 4
8MB	1Mx64			
16MB	2Mx64			
16MB	1Mx64	1Mx64		
24MB	2Mx64	1Mx64		
24MB	1Mx64	1Mx64	1Mx64	
32MB	2Mx64	2Mx64		
32MB	4Mx64			
32MB	1Mx64	1Mx64	1Mx64	1Mx64
40MB	2Mx64	2Mx64	1Mx64	
40MB	2Mx64	1Mx64	1Mx64	1Mx64
40MB	4Mx64	1Mx64		
48MB	2Mx64	2Mx64	2Mx64	
48MB	2Mx64	2Mx64	1Mx64	1Mx64
48MB	4Mx64	1Mx64	1Mx64	
56MB	4Mx64	2Mx64	1Mx64	
56MB	4Mx64	1Mx64	1Mx64	1Mx64
64MB	2Mx64	2Mx64	2Mx64	2Mx64

Table 3-1: Memory Configurations

Memory	DIMM 1	DIMM 2	DIMM 3	DIMM 4
64MB	4Mx64	4Mx64		
64MB	8Mx64			
80MB	4Mx64	2Mx64	2Mx64	2Mx64
80MB	4Mx64	4Mx64	1Mx64	1Mx64
80MB	8Mx64	2Mx64		
80MB	8Mx64	1Mx64	1Mx64	
96MB	4Mx64	4Mx64	2Mx64	2Mx64
96MB	4Mx64	4Mx64	4Mx64	
96MB	8Mx64	2Mx64	1Mx64	1Mx64
112MB	4Mx64	4Mx64	4Mx64	2Mx64
112MB	8Mx64	4Mx64	2Mx64	
112MB	8Mx64	4Mx64	1Mx64	1Mx64
128MB	16Mx64			
128MB	4Mx64	4Mx64	4Mx64	4Mx64
128MB	8Mx64	4Mx64	4Mx64	
128MB	8Mx64	8Mx64		
160MB	16Mx64	2Mx64	1Mx64	1Mx64
160MB	8Mx64	4Mx64	4Mx64	4Mx64
160MB	16Mx64	4Mx64		

Table 3-1a: Memory Configurations

Memory	DIMM 1	DIMM 2	DIMM 3	DIMM 4
192MB	16Mx64	4Mx64	4Mx64	
192MB	8Mx64	8Mx64	4Mx64	4Mx64
192MB	8Mx64	8Mx64	8Mx64	
224MB	16Mx64	8Mx64	2Mx64	2Mx64
224MB	16Mx64	8Mx64	4Mx64	
256MB	16Mx64	16Mx64		
256MB	16Mx64	8Mx64	4Mx64	4Mx64
256MB	16Mx64	8Mx64	8Mx64	
256MB	8Mx64	8Mx64	8Mx64	8Mx64
288MB	16Mx64	16Mx64	4Mx64	
320MB	16Mx64	8Mx64	8Mx64	8Mx64
384MB	16Mx64	16Mx64	16Mx64	
384MB	16Mx64	16Mx64	8Mx64	8Mx64
448MB	16Mx64	16Mx64	16Mx64	8Mx64
512MB	16Mx64	16Mx64	16Mx64	16Mx64
1GB	32Mx64	32Mx64	32Mx64	32Mx64

Table 3-1b: Memory Configurations

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).
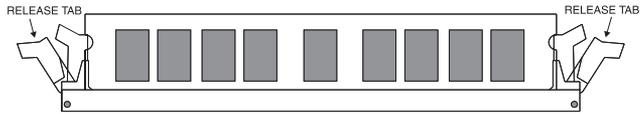
Figure 3-1: Installing a 168-Pin DIMM

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.

CPU Installation

The Dual Fortress is designed to support single or dual 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
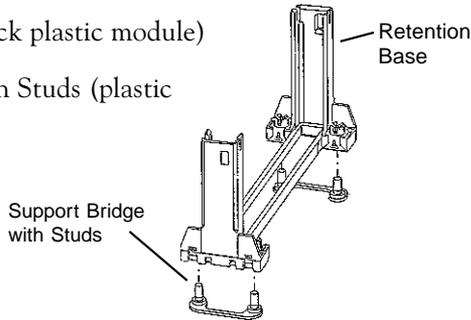
Follow the steps below to install the kit:

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 Dual Fortress toward the component side until they snap into place.

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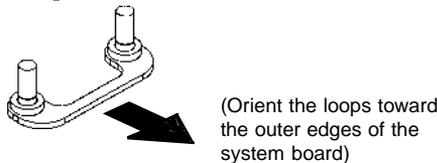
2. Place the Retention Base over the Slot 1 connector and insert it down into the Support Bridges with studs. Note the "Keyed" location of both Slot 1 and the Retention Base.
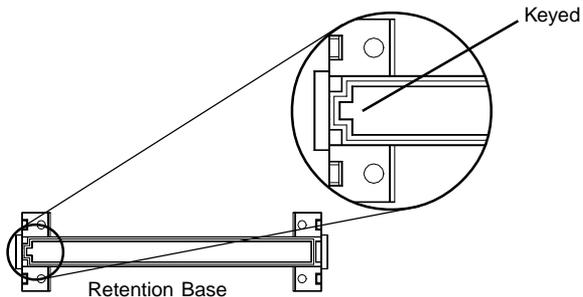
3. Using a screwdriver, tighten all four sides of the Retention Base.
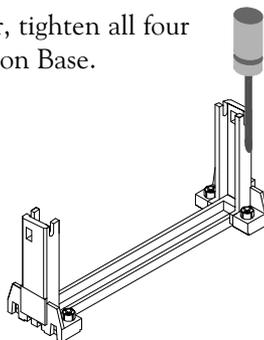
Installing a CPU

If you are installing a single CPU, the Primary CPU slot must be used. You must also install a terminator card in the Secondary slot.
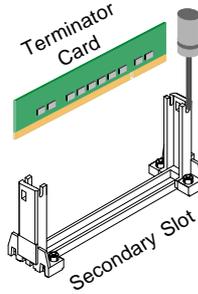
If you are installing dual CPU's, you must install the VRM in the VRM socket.

Voltage Regulator Module
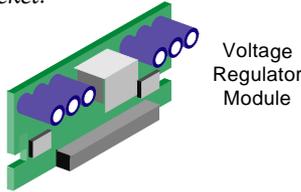
Follow the steps below to install the Pentium II processor:

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.

Top Bar

Pin

Base

Pin
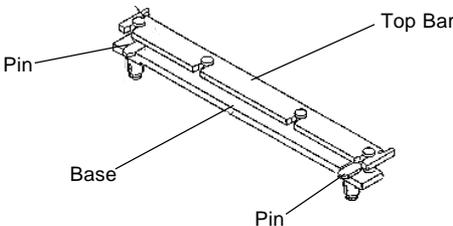
5. Gently insert the processor cartridge down into the Retention Module, making sure the connector on the processor cartridge and the connector on the Slot 1 connector are aligned (refer to the keyed location on the previous page).

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.
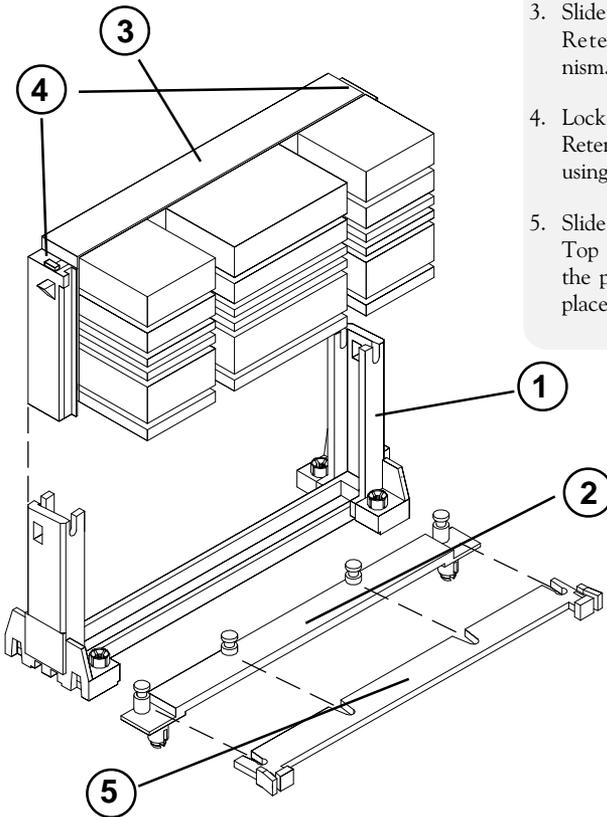
Figure 3-2: Installing a CPU

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).
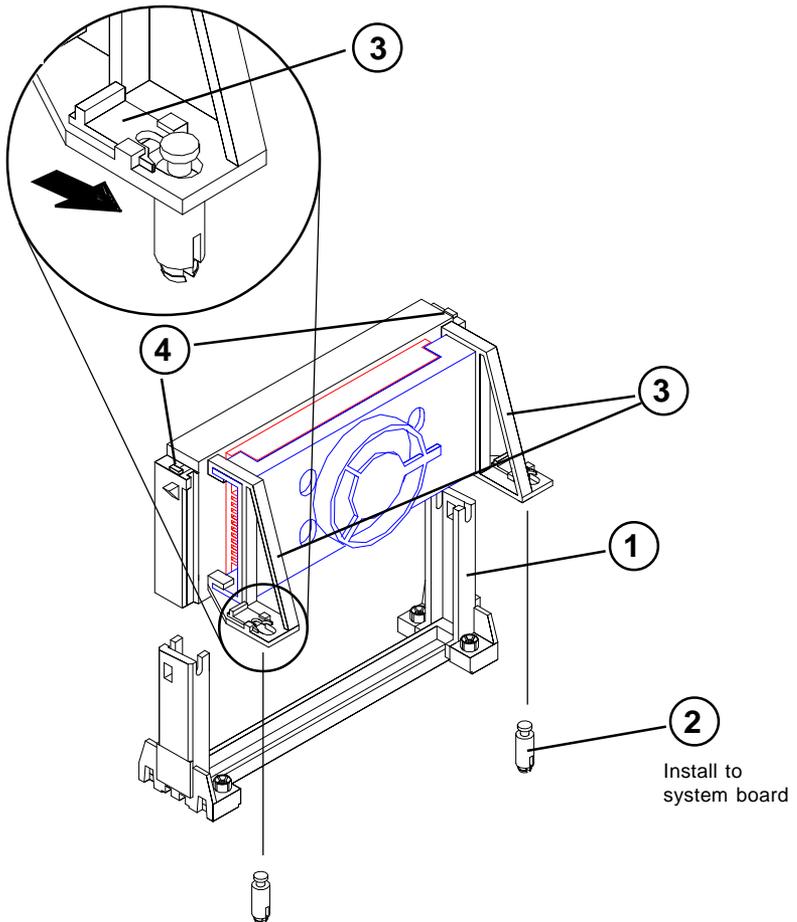
Figure 3-3: Installing a CPU (Boxed version)

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.
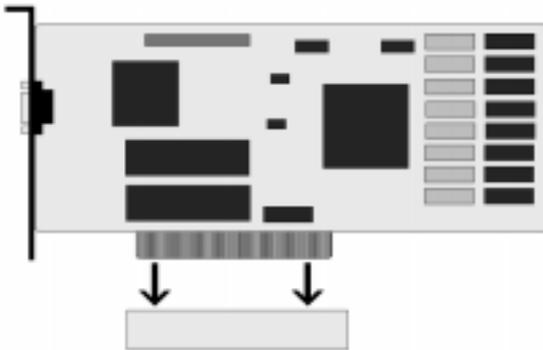
Figure 3-4: Installing a PCI Card

Installing an ISA Peripheral Card

Micronics ISA slots accommodate all standard ISA peripherals. 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 drivers.
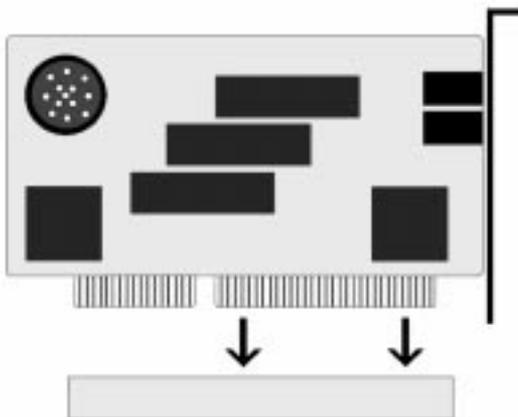
Figure 3-5: Installing an ISA Peripheral Card

Installing a CD-ROM Drive

If you are installing a CD-ROM drive, Micronics recommends the installation of an IDE CD-ROM drive. *The instructions below will help you with the installation, but also refer to the documentation that accompanied your CD-ROM drive.*

Before starting the setup and installation, make sure your computer is off and the power cord is disconnected from the wall outlet. Your CD-ROM drive kit should contain the following items for a successful installation:

❏ CD-ROM Drive with installation hardware
❏ Interface Cable
❏ CD Audio Cable

1. Connect the ribbon cable as described in the CD-ROM's documentation, making sure the red stripe on the cable is aligned with pin 1 of the connectors.

2. Connect the audio cable to the CD-ROM drive's audio connector.

3. Connect the other end of the audio cable to the MPC-2 compatible CD-ROM audio connector on the Dual Fortress system board (see Figures 2.1 and 2.2).

4. Connect the power supply cable to the CD-ROM drive's power connector.

5. Install the CD-ROM device drivers. CD-ROM drives require device drivers to access the drive and are generally provided by the manufacturer of the CD-ROM drive. Usually one device driver is added to the CONFIG.SYS file and one to the AUTOEXEC.BAT file.

6. If you are using the CD-ROM drive in an MS-DOS environment, the utility MSCDEX.EXE must also be added to the AUTOEXEC.BAT file. Consult your DOS manual for more information.

Dual Fortress Sound Option

You can connect external sound devices to your Dual Fortress system board to take advantage of the optional sound support (refer to Figure 2.2). The sound option includes 16-bit stereo sound and a game and MIDI port. See Chapter 5 for information on installing sound device drivers.

Connecting Sound Devices
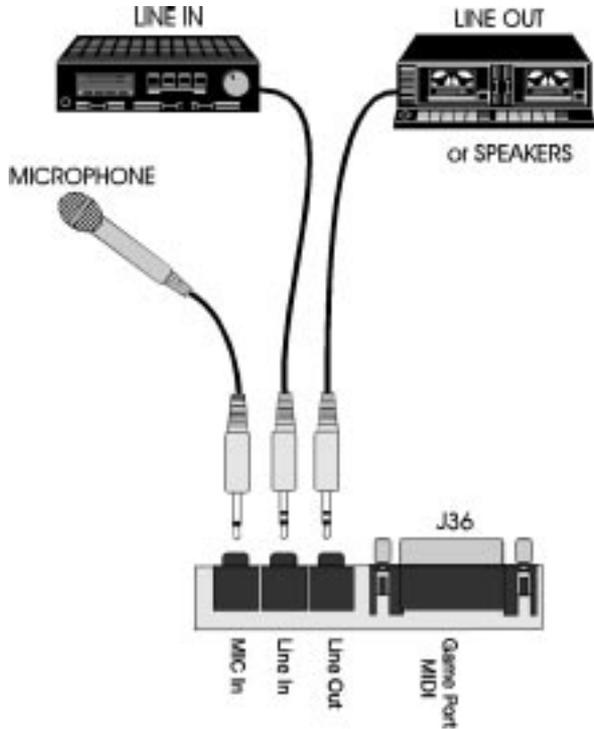
Figure 3-6: Connecting External Sound Devices

Game Port

You can use the Game Port connector to connect an IBM PC compatible joystick or MIDI instrument.

Line Out

The Line Out jack allows you to connect the audio output of the audio controller to your home stereo, VCR, or amplified speakers.

Line In

You may connect an external mono or stereo audio source to the audio controller, such as a tape player or radio. Use the appropriate converter cable to interface to your external equipment.

MIC In

The MIC In jack will accommodate a 300-600 ohm microphone.

Chapter

4

The BIOS Setup Utility

Configuration

After the Dual Fortress 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 Dual Fortress. 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.

```
PhoenixBIOS  Version 4.0 Release 6.0
Copyright  1985-1997 Phoenix Technologies Ltd., All Rights Reserved

Micronics Computers, Inc.          Dual Fortress-xxx

CPU=Pentium II  xxx
xxxxkb Cache SRAM Passed
xxxx640K System RAM Passed
xxxxxxxK Extended RAM Passed
"memory type" Detected

System BIOS Shadowed and Cached
Video BIOS Shadowed and Cached


PS/2 Mouse Initialized



Press <F2> to enter SETUP
```

Figure 4-1: Power-Up Screen

When "Press <F2> to enter Setup" appears at the bottom of the screen, press the <F2> 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.

Running the Setup Procedure

The Dual Fortress system board has six primary CMOS configuration screens: Main Screen, Advanced Screen, Security Screen, Power Screen, Boot Screen and Exit Screen. To toggle between the screens, press the right arrow $<\rightarrow>$ and the left arrow $<\leftarrow>$ keys.

Setting the Main Screen

The CMOS Main screen (Figure 4-2) is used to set the time and date, to set the floppy drive types, to configure IDE hard disks and to configure the video. This chapter explains how to configure each of these categories. To move between the categories, use the up and down arrow $<\uparrow/\downarrow>$ keys.

```
  PhoenixBIOS Setup - Copyright 1985-97  Phoenix Technologies Ltd.
 ┌──────────────────────────────────────────────────────────────────┐
 │ Main   Advanced    Security    Power    Boot    Exit               │
 │                                               Item Specific Help   │
 │  System Time:          [HH:MM:SS]                                  │
 │  System Date:          [MM/DD/YYYY]          <Tab>, <Shift-Tab>, or│
 │                                              <Enter> selects field.│
 │  Diskette Drive A:     [1.44 MB, 3 1/2"]                           │
 │  Diskette Drive B:     [Not Installed]                             │
 │ ▶Primary Master:       [Auto]                                      │
 │ ▶Primary Slave:        [None]                                      │
 │ ▶Secondary Master:     [None]                                      │
 │ ▶Secondary Slave:      [None]                                      │
 │                                                                    │
 │  Numlock:              [Auto]                                      │
 │                                                                    │
 │  External Cache:       [Enabled]                                   │
 │  Video BIOS:           [Shadowed & Cached]                         │
 │  System BIOS:          [Shadowed & Cached]                         │
 │                                                                    │
 │  System Memory:        [640KB]                                     │
 │  Extended Memory:      [xxx MB]                                    │
 │                                                                    │
 │  F1  Help  ↑↓Select Item   -/+ Change Values    F9 Setup Defaults  │
 │  Esc Exit  ←→Select Menu   Enter Select Sub-Menu F10 Previous Values│
 └──────────────────────────────────────────────────────────────────┘
```

Figure 4-2: CMOS Main Screen

System Time and Date

To set the time, use the < - > key to decrease the number and the < + > key to increase the number. To move the prompt forward, use the <Tab> key; to move the prompt backward, use the <Shift-Tab> key. To set the date, use the up and down arrows<↑/↓> to highlight the System Date and follow the same procedure used to set the time.

Diskette A or B

To configure a floppy drive added to or removed from your computer, use the up and down arrow keys <↑/↓> to select the desired drive. Use the < +/- > 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.

Numlock

Setting this to ON activates Numlock upon boot. Setting this to Auto (default) activates Numlock if the BIOS detects a numeric keyboard. It may also be set to OFF.

External Cache

This selection allows you to enable the external memory cache. For optimal performance, select Enabled.

Video BIOS

The Video BIOS category allows you to Shadow or Shadow & Cache the video BIOS. Choosing Shadowed & Cached (default) caches the shadowed video BIOS for even higher performance. Choosing Shadowed copies the video BIOS into RAM for faster execution. To disable the Video BIOS category, select Disabled.

System BIOS

The System BIOS category allows you to Shadow or Shadow & Cache the system BIOS. Choosing Shadowed & Cached (default) caches the shadowed system BIOS for even higher performance. Choosing Shadowed copies the system BIOS into RAM for faster execution. To disable the System BIOS category, select Disabled.

System Memory

The System Memory category identifies the size of the base memory. It cannot be changed.

Extended Memory

The Extended Memory category automatically detects the amount of memory installed above the amount in the System Memory category. Because the BIOS automatically calculates the amount of memory installed in your system, you cannot change this category without adding or removing memory.

```
        PhoenixBIOS Setup - Copyright 1985-97  Phoenix Technologies Ltd.
    Main   Advanced    Security    Power    Boot    Exit
                                                        Item Specific Help

    Type:                       [Auto]

    Multi-Sector Transfers:     [Auto]
    LBA Mode Control:           [Disabled]
    32 Bit I/O:                 [Disabled]
    Transfer Mode:              [Standard]
    Smart Monitoring:           [Disabled]




    F1   Help       Select Item     -/+ Change Values        F9 Setup Defaults
    Esc Exit        Select Menu     Enter Select Sub-Menu    F10 Previous Values
```

Figure 4-3: IDE Device Submenu

Type

This category selects the drive type installed in the system. The options are Auto (default), 1-39, User and None. If Autotype Fixed Disk does not find your drive's parameters, fill this information in manually under the User category. This information may be in the manual which came with your system. If not, contact your dealer or the hard drive manufacturer to fill in this category. If you are using a SCSI hard drive, select None and refer to the documentation which came with the SCSI adapter.

Multiple-Sector Transfers

This category determines the number of sectors per block for multiple sector transfers. The options are Auto (default), Disabled, 2 Sectors, 4 Sectors, 6 Sectors, 8 Sectors and 16 Sectors.

LBA Mode Control

Enabling this selection causes LBA (Logical Block Addressing) to be used in place of Cylinders, Heads and Sectors. The default setting is Enabled.

32-Bit I/O

This category allows you to enable the 32-bit I/O function of the PCI IDE controller. Select Disabled if your drive will not run at this speed. The default setting is Disabled.

Transfer Mode

This category sets the transfer speeds for IDE devices. The Standard option is the default setting. The Fast PIO 1, Fast PIO 2, Fast PIO 3 and Fast PIO 4 options are for higher speed devices.

Smart Monitoring

This feature will monitor your hard drive and report any problems detected. The default setting cannot be changed.

Setting the Advanced Screen

To move to the Advanced screen, use the left and right arrow keys <←/→> keys until you see the screen below.

```
        PhoenixBIOS Setup - Copyright 1985-97  Phoenix Technologies Ltd.
     Main   Advanced   Security    Power    Boot   Exit
                                                          Item Specific Help
       Serial Port A:                 [Auto]
       Serial Port B:                 [Auto]
         Mode:                        [Normal]

       Parallel Port:                 [Auto]
         Mode:                        [Bi-Directional]
       Floppy Diskette Controller:    [Enabled]
       Integrated PCI IDE:            [Both]
       Integrated Sound Card:         [Enabled]
       LM78:                          [Enabled]
       Use MP Spec:                   [1.1]
       Plug & Play O/S:               [No]
       Reset Configuration Data:      [No]
    → PCI Configuration:
       PS/2 Mouse:                    [Enabled]
       Secured Setup Configuration:   [No]
       Large Disk Access Mode:        [DOS]
       DRAM Type:                     [Non-Parity]


     F1  Help   ↑↓ Select Item   -/+ Change Values      F9 Setup Defaults
     Esc Exit   ←→ Select Menu   Enter Select Sub-Menu  F10 Previous Values
```

Figure 4-4: Advanced Screen

Serial Port A

Serial Port A may be configured using the following options: Disabled (No configuration), Enabled (User configuration), Auto (BIOS configuration) and PnP O/S (O/S configuration).

Serial Port B

Serial Port B may be configured using the following options: Disabled (No configuration), Enabled (User configuration), Auto (BIOS configuration) and PnP O/S (O/S configuration).

Parallel Port

The parallel port may be configured using the following options: Disabled (No configuration), Enabled (User configuration), Auto (BIOS configuration) and PnP O/S (O/S configuration).

Floppy Disk Controller

The selection allows you to enable or disable the floppy disk controller.

Integrated PCI IDE

Enables or disables the integrated Local Bus IDE adapter. The IDE controller may be set for Primary, Both (default) or Disabled.

Integrated Sound

Enables or disables the integrated sound interface. The default setting is Enabled.

LM78

Enable or disable the integrated LM78 microprocessor system hardware monitor. The LM78 can be used to monitor temperatures, power supply voltages and fan speeds.

Use MP Specification

This selection allows you to select the 1.1 (default) or 1.4 multiprocessor specification.

Plug & Play O/S

This selection allows your system to work with a Plug and Play operating system such as Windows 95. The default setting is No. NOTE: This selection should be set to No when using Windows 3.1 or Windows NT.

Reset Configuration Data

Select Yes 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 No.

PCI Configuration

Use this selection for additional setup menus to configure PCI devices.

PS/2 Mouse

When disabled, this selection prevents the PS/2 mouse from functioning and frees up IRQ12. Selecting Enabled (default) allows the operating system to determine whether to enable or disable the mouse.

Secured Setup Configuration

Select Yes if you want the system settings to be secured from change by a Plug and Play operating system. The default setting is No.

Large Disk Access Mode

If you are using a DOS operating system (MS-DOS, Novell DOS or PC-DOS), set to DOS (default). If you are using anything else, set to OTHER.

DRAM Type

The DRAM type can be set for Non-Parity (default), Parity or ECC. Selecting ECC will detect the parity error and allow the system to correct the error.

Security Screen

The Security screen controls access to the computer. The security screen allows for settings of two passwords. The Supervisor Password allows access to the system and Setup. The User Password allows access to the system, but not to all Setup features.

```
┌─────────────────────────────────────────────────────────────┐
│      PhoenixBIOS Setup - Copyright 1985-97  Phoenix Technologies Ltd. │
│   Main    Advanced   Security   Power    Boot    Exit         │
│                                           ┌───────────────────┤
│                                           │ Item Specific Help │
│   Set Supervisor Password:   [Enter]      │                   │
│   Set User Password:         [Enter]      │                   │
│                                           │                   │
│   Password on Boot:          [Disabled]   │                   │
│   Fixed disk boot sector:    [Normal]     │                   │
│   Diskette Access:           [Supervisor] │                   │
│                                           │                   │
│                                           │                   │
│                                           │                   │
│                                           │                   │
│                                           │                   │
│                                           │                   │
│                                           │                   │
│                                           │                   │
│                                           │                   │
│                                           │                   │
│                                           │                   │
│   F1  Help  ↑↓Select Item    -/+ Change Values   F9 Setup Defaults │
│   Esc Exit  ←→Select Menu    Enter Select Sub-Menu  F10 Previous Values │
└─────────────────────────────────────────────────────────────┘
```
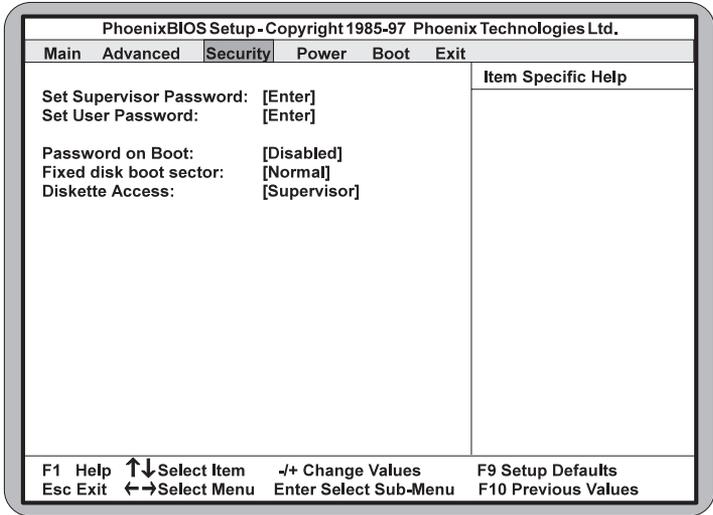
Figure 4-5: Security Setup Screen

Set Supervisor Password

This selection controls access to the Setup utility. Press the ENTER key to enter the Supervisor Password submenu. The screen on the following page appears. This value is access speed, so a lower value means a faster system.

```
       PhoenixBIOS Setup - Copyright 1985-97 Phoenix Technologies Ltd.
   Main        Advanced      Security       Power        Exit



                        Set Supervisor Password
                  Enter new password:    [              ]
                  Re-enter new password: [              ]






                             Enter Accepts
                              ESC Aborts
```
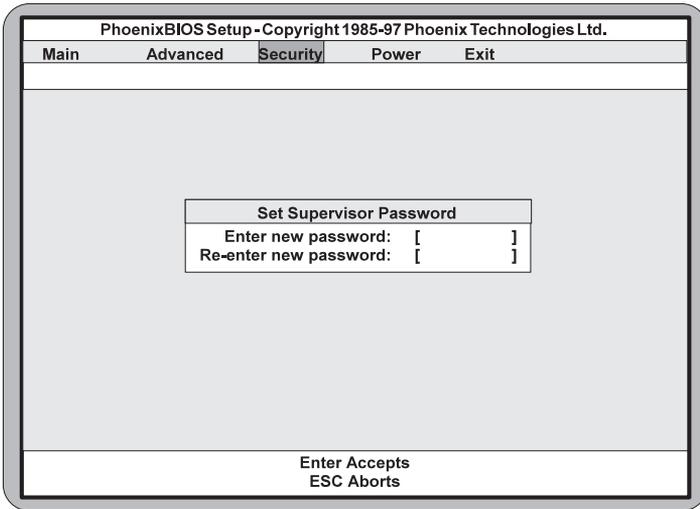
Figure 4-6: Supervisor Password Submenu

Type the password and press the ENTER key. Retype the
password and press the ENTER key again. Write down
the password somewhere safe so it will not be forgotten.
The password may be disabled by setting the new pass-
word to nothing (pressing the ENTER key without first
typing a password).

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

Set User Password

This selection controls access to the Setup utility. Follow
the same procedure used to set the Supervisor Password.

*NOTE: After a password is entered, it is saved immediately.
All other changes may still be discarded (see Exit Screen).*

Password on Boot

When enabled, the system requires a password upon power up. Either the Supervisor or User Password may be entered.

Fixed Disk Boot Sector

This selection allows the boot sector of the fixed disk to be write protected. The default setting is Normal. When set for Write Protected, it serves as a form of virus protection. If the passwords are enabled, this option may only be changed by the Supervisor.

Diskette Access

This selection allows floppy disk access with an option of the supervisor or user. Selecting Supervisor (default) gives floppy disk access to the supervisor only. Selecting User gives floppy disk access to both the user *and* the supervisor. If the passwords are enabled, this option may only be changed by the Supervisor.

Power Screen

The Power Screen controls the power management functions of the system. To move to the Power Screen, use the left and right arrow $<\leftarrow/\rightarrow>$ keys until it appears (Figure 4-7). To move between the categories, use the up and down arrow keys $<\uparrow/\downarrow>$.

```
         PhoenixBIOS Setup - Copyright 1985-97  Phoenix Technologies Ltd.
    Main    Advanced    Security    Power    Boot    Exit
                                                        Item Specific Help

    Power Management:              [Disabled]

    Standby Timeout:               [Off]
    Auto Suspend Timeout:          [Off]












    F1  Help   ↑↓Select Item    -/+ Change Values      F9 Setup Defaults
    Esc Exit   ←→Select Menu    Enter Select Sub-Menu   F10 Previous Values
```
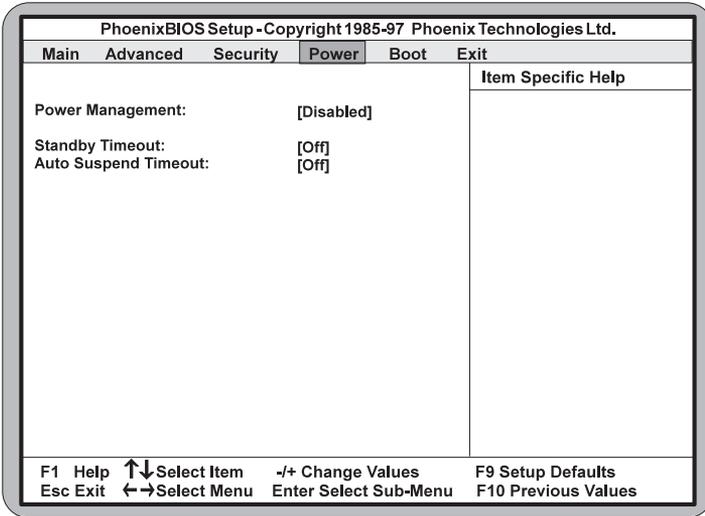
Figure 4-7: Power Screen

Power Management

This selection allows you to change the system power management settings. Maximum Power Savings conserves the greatest amount of system power. Maximum Performance conserves power but allows greatest system performance. To alter these settings, choose Customize. To turn off power management, choose Disabled (default).

Standby Time-out

The Standby Time-out selection sets the amount of time that elapses for the system to enter Standby Mode. Standby Mode turns off various devices in the system, including the display screen, until you start using the system again. The options are Off (default), 1 min., 2 min., 4 min., 6 min., 8 min., 12 min. or 16 min.

Auto Suspend Time-out

The Standby Time-out selection sets the amount of time that elapses for the system to enter Suspend Mode. The options are Off (default), 5 min., 10 min., 15 min., 20 min., 30 min., 40 min. or 60 min. Before making changes, "Customized" must be selected in the Power Management Mode selection.

Boot Screen

The Boot screen allows you to configure the power up system configuration settings. To move to the Boot Screen, use the left and right arrow $<\leftarrow/\rightarrow>$ keys until it appears (Figure 4-8). To move between the categories, use the up and down arrow keys $<\uparrow/\downarrow>$.

```
        PhoenixBIOS Setup-Copyright 1985-97  Phoenix Technologies Ltd.
   Main    Advanced    Security    Power    Boot    Exit
                                               Item Specific Help
→Boot Device Priority:
→Hard Drive Boot Order:

 Floppy Check:              [Enabled]








   F1  Help  ↑↓Select Item     -/+ Change Values      F9 Setup Defaults
   Esc Exit  ←→Select Menu     Enter Select Sub-Menu  F10 Previous Values
```
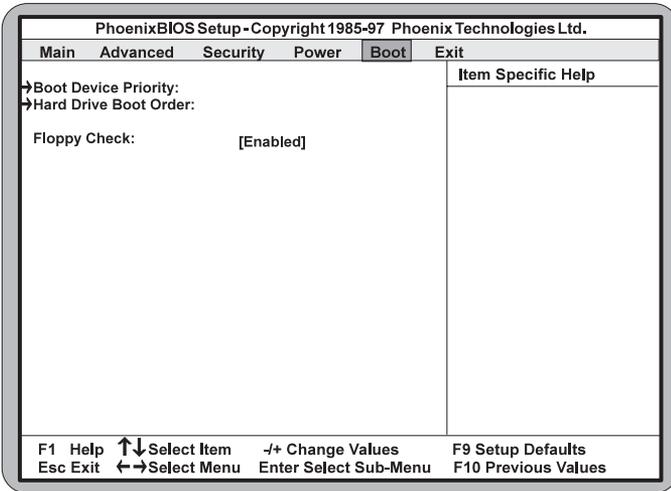
Figure 4-8: Boot Screen

Hard Drive Boot Order

This selection will read the diskette drive (default) and the hard drive in sequence on boot.

Floppy Check

This selection checks for the existence of a floppy drive. The default setting is Enabled.

Exit Screen

After you complete configuring the BIOS, select the Exit screen. To move to the Exit Screen, use the left and right arrow $<\leftarrow/\rightarrow>$ keys until it appears (Figure 4-9). To move between the categories, use the up and down arrow keys $<\uparrow/\downarrow>$.


```
        PhoenixBIOS Setup - Copyright 1985-97 Phoenix Technologies Ltd.
   Main    Advanced     Security    Power    Boot   Exit
                                                            Item Specific Help
   Save Changes & Exit
   Discard Changes & Exit                                   Exit after writing all
   Load Setup Defaults                                      changed SETUP item
   Discard Changes                                          values to CMOS.
   Save Changes




   F1  Help  ↑↓ Select Item    -/+ Change Values        F9 Setup Defaults
   Esc Exit  ←→ Select Menu    Enter Select Submenu      F10 Previous Values
```
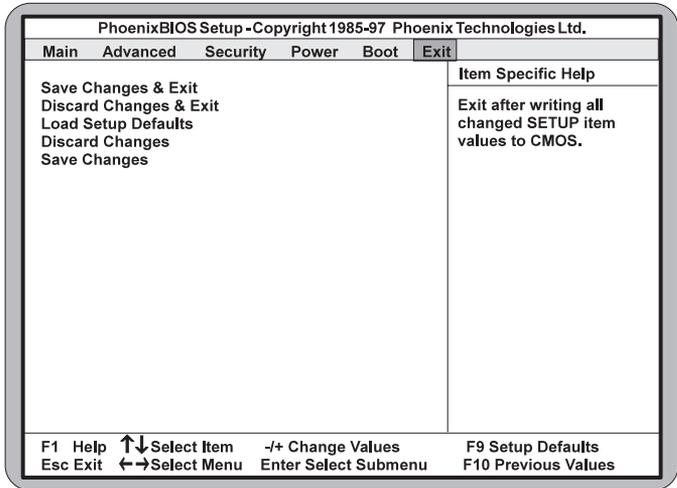
Figure 4-9: Exit Screen

Choose "Save Changes and Exit" and reboot the computer. Your computer is ready for use. wake-up event is keyboard activity.

Chapter

5

Installing Device Drivers

This chapter explains how to install the software device drivers and utilities necessary to utilize the optional sound support. Other drivers and utilities are available through our online services.

About Device Drivers

Device drivers are necessary for the computer system to communicate with devices such as CD-ROM drives, sound controllers, graphics adapters or devices that are not natively supported by the system BIOS. Once started, device drivers remain active in the background of the computer system. Usually a device driver is added to the CONFIG.SYS file, the AUTOEXEC.BAT file or both.

Installing the Sound Drivers

Once you have connected your external sound devices, you can install the sound drivers. NOTE: If you are installing a CD-ROM drive, it is recommended you install it before setting up the sound devices. See Installing a CD-ROM Drive in Chapter 3.

1. Follow the instructions in Chapter 3 on connecting external sound devices.

2. If you previously installed another sound card, remove it and all associated files from your AUTOEXEC.BAT and CONFIG.SYS files. If you are using Windows 3.1x, you must also remove all associated files from the WIN.INI and SYSTEM.INI files. (For more information, please contact the sound driver manufacturer.)

3. Start your computer system.

4. Insert the sound driver disk into your floppy drive.

5. If you are using Windows 3.1x, go to the Program Manager File menu, click on Run and type A:\SETUP.

6. If you are using Windows 95, refer to the Windows 95 user's manual for instructions on how to install sound drivers.

7. If you are using Windows NT, refer to the Windows NT user's manual for instructions on how to install sound drivers.

8. If you are using OS/2, refer to the README file on the OS/2 disk for instructions on how to install sound drivers.

9. Once the software is copied, the install program automatically updates the system files.

Appendix

A

Specifications

Part Number: 09-00301

Processor: Intel Pentium II® chip - 233/266 MHz
                    Dual Intel Slot 1®
                    One integrated VRM and one VRM
                    socket.

CPU Clock Select: Frequency synthesizer chip
                    Support for 66MHz CPU bus

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

Form Factor: ATX footprint
                    Four layer board
                    Double stack I/O shield
                    20-pin ATX power connector

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

BIOS: Phoenix 4.06 BIOS on 2MB Flash
                    APM 1.2
                    PCI auto configuration
                    Auto detection of memory size
                    Auto detection and display of EDO
                    memory.
                    Auto detection CPU fan failure
                    Auto detection of IDE hard disk types
                    Soft Power Down
                    DMI

Memory Capacity: Maximum memory - 1GB
Four unbuffered 168-pin DIMM sockets
Supports FPM, EDO and BEDO DRAM memory
ECC supported via chipset when using parity

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

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

Onboard Sound: Yamaha OPL3 and OPL4
(optional) Sound Blaster™ compatible 16-bit stereo
Line In, Line Out, MIC and Game/MIDI ports
4-pin CD-ROM audio header
4-pin Line In header (ATAPI)
Built-in wavetable synthesis
Sound drivers

Hardware LM78 Microprocessor System Hardware Monitor
Management:

I/O Ports: Two high speed serial ports (16550 compatible)
Enhanced 25-pin Parallel Port with ECP and EPP
IrDA compliant IR header
Two USB connectors

Floppy Port: Supports 360K - 2.88MB formats
Auto detection of add-in floppy controllers

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 Dual Fortress is located is critical. Micronics recommends the following environmental specifications:

Temperature Range

Operating: 50 to 104 degrees Fahrenheit (10 to 40 degrees Celsius).

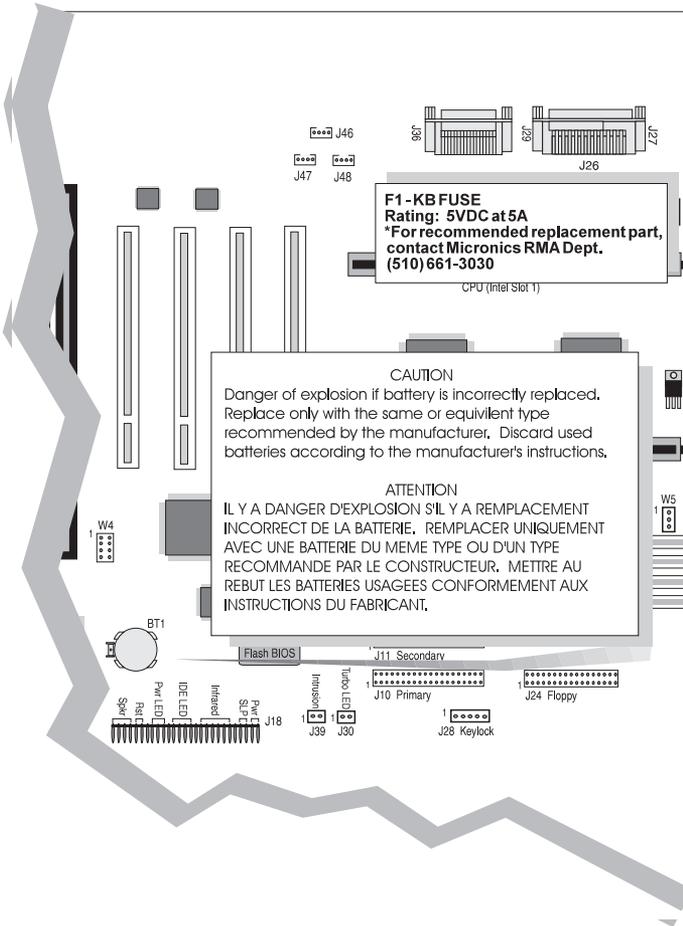Non -Operating: 50 to 140 degrees Fahrenheit (10 to 60 degrees Celsius).

Shipping: -22 to 140 degrees Fahrenheit (-30 to 60 degrees Celsius).

Relative Humidity

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

Battery Disposal

The diagram shows a system board layout with the following labels:

J46, J47, J48, J36, J29, J27, J26

F1 - KB FUSE
Rating: 5VDC at 5A
*For recommended replacement part, contact Micronics RMA Dept. (510) 661-3030

CPU (Intel Slot 1)

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.

W4, W5, BT1

Flash BIOS, J11 Secondary, J10 Primary, J24 Floppy

Spkr, Rst LED, Pwr LED, IDE LED, Infrared, Pwr SLP, Intrusion, Turbo LED, J18, J39, J30, J28 Keylock

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 Dual Fortress 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 France UK	(510) 661-3000 (510) 651-6982 (Fax) +33 (1) 45 43 56 26 +33 (1) 45 43 17 78 (Fax) +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 UK	(510) 651-6837 14400 baud rate, Parity=N, Data Bits=8, Stop Bits=1 YMODEM and ZMODEM (recommended file transfer protocols) +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 Europe	http://www.micronics.com http://www.mcrni.com
Customer Service - Order Micronics and Orchid products	M-F: 8:00am to 5:00pm (PST)	USA France UK Germany Taiwan	(800) 577-0977 (510) 651-3666 (Fax) +33 (1) 45 43 56 26 +33 (1) 45 43 17 78 (Fax) +44 (1256) 479 898 +44 (1256) 364222 (Fax) +49 (89) 58 09 82 55 +49 (89) 58 09 82 25 (Fax) +886 2 918 5005 +886 2 911 5472 (Fax)

Table A-1: Support and Information Services

B

POST Messages

The following table lists the Power On Self Test (POST) messages, possible causes and solutions.

Message	Possible Cause	Solution
DISKETTE DRIVE A FAILURE	Drive A failed or is missing.	Check Setup and cable connections.
DISKETTE DRIVE B FAILURE	Drive B failed or is missing.	Check Setup and cable connections.
EXTENDED RAM FAILED AT OFFSET: nnnn	Extended memory not working or configured properly.	Replace defective memory.
FAILING BITS: nnnn	Memory failure in System, Extended, or Shadow memory.	Replace defective memory.
FIXED DISK X FAILURE (where X =0 or 1)	The hard disk is not configured or working properly.	Rerun SETUP and check connections, or replace hard disk.
FIXED DISK CONTROLLER FAILURE	The controller card has failed.	Check configuration and connections, or replace controller card.
INCORRECT DRIVE A TYPE	Floppy drive A: not set correctly in Setup.	Run Setup.
INCORRECT DRIVE B TYPE	Floppy drive A: not set correctly in Setup.	Run Setup.
INVALID NVRAM MEDIA TYPE	NVRAM chip is bad.	Requires repair of system board.
KEYBOARD ERROR, or KEYBOARD CONTROLLER ERROR	The keyboard or keyboard controller failed.	Check connections. You may have to replace the keyboard or controller.
KEYBOARD ERROR nn	A key is jammed or was held down during boot.	Make sure the keys are not jammed or dirty.
KEYBOARD LOCKED	Keyswitch on the front of the case is locked.	Unlock the keyswitch.

Message	Possible Cause	Solution
MONITOR TYPE DOES NOT MATCH CMOS	Monitor type not correctly identified in Setup.	Run Setup and enter correct monitor type.
OPERATING SYSTEM NOT FOUND	Operating system cannot be located on Drive C: or Drive A:	Check Setup to see if Drive A: and C: are properly configured, or put a bootable disk in Drive A:
PARITY CHECK 1 nnnn	Parity error found in the system bus.	Check Setup. Board repair may be required.
PARITY CHECK 2 nnnn	Parity error found in the I/O bus.	Check Setup. Board repair may be required.
PREVIOUS BOOT INCOMPLETE - DEFAULT CONFIGURATION USED	Previous POST did not complete successfully.	Run Setup, load default BIOS settings, make any necessary adjustments, and save the changes
REAL TIME CLOCK ERROR	Real-time clock failed BIOS test.	May require battery replacement or board repair.
SHADOW RAM FAILED AT OFFSET	Shadow RAM failed.	May require repair of system board.
SYSTEM BATTERY IS DEAD	System battery died.	Replace the system battery and run Setup to reconfigure the system.
SYSTEM CACHE ERROR - CACHE DISABLED	External (L2) cache failed BIOS test.	System will still run, but slower. Replace cache at convenience.
SYSTEM CMOS CHECKSUM BAD - RUN SETUP	System CMOS has been corrupted or modified incorrectly.	Run Setup and reconfigure the system.
SYSTEM RAM FAILED AT OFFSET: nnnn	System RAM failed.	Replace defective RAM.
SYSTEM TIMER ERROR	Timer test failed.	Requires repair of system board.

Appendix

C

Beep and POST Codes

Beep codes are a series of beeps sent through the speaker which indicate a problem during the Power On Self Test (POST). If text appears on the video screen, the Dual Fortress has completed POST; any other tone from the speaker indicates something other than a POST error. These tones *are not* described in the tables on the following pages.

The beep error codes are a series of beeps. The duration of the beep tones are constant, but the length of the pauses between the beeps varies. For example: a 1-3-3 beep code will sound like one beep, a pause; three beeps consecutively, another pause and then three more beeps.

One beep code is often misunderstood. If a video card is not installed or is failing, the system board will generate a long-short-long-short beep code. This is often interpreted as a 1-2-1 beep code. But POST errors always vary in the length of the pause and not the duration of the beep tone.

Another way of identifying a POST error is to use a device called a POST card. This peripheral card is inserted into one of the ISA slots and has an LED (or LCD) read out showing the contents of port 80h.

The following tables list all beep codes and POST routines.

Code	Beeps	POST Routine Description
02		Verify Real Mode.
04		Get CPU type.
06		Initialize system hardware.
08		Initialize chipset registers with initial POST values.
09		Get in POST Reg.
0A		Initialize CPU registers.
0C		Initialize cache initial POST values.
OE		Initialize I/O.
OF		Initialize the localbus IDE.
10		Initialize Power Management.
11		Load alternate registers with initial POST values.
12		Jump to UserPatch0.
14		Initialize keyboard controller.
16	2-2-3	BIOS ROM checksum.
18		8254 timer initialization.
1A		8237 DMA controller initialization.
1C		Reset Programmable Interrupt Controller.
20	3-1-1	Test DRAM refresh.
22	3-1-3	Test 8742 Keyboard Controller.
24		Set ES segment register to 4 GB.
28		Autosize DRAM.
2A		Clear 512K base RAM.
2C	3-4-1	Test 512K base address lines.
2E	3-4-3	Test 512K base memory.
32		Test CPU bus-clock frequency.
34		Test CMOS RAM.
35		Initialize alternate chipset registers.
37		Reinitialize the chipset (MB only).
38		Shadow system BIOS ROM.
39		Reinitialize the cache (MB only).
3A		Autosize cache.
3C		Configure advanced chipset registers.
3D		Load alternate registers with CMOS values.
40		Set initial CPU speed.
42		Initialize interrupt vectors.
44		Initialize BIOS interrupts.
46	2-1-2-3	Check ROM copyright notice.
47		Initialize manager for PCI Option ROMs.
48		Check video configuration against CMOS.
49		Initialize PCI bus and devices.

Code	Beeps	POST Routine Description
4A		Initialize all video adapters in system.
4C		Shadow video BIOS ROM.
4E		Display copyright notice.
50		Display CPU type and speed.
51		Initialize EISA board.
52		Test keyboard.
54		Set key click if enabled.
56		Enable keyboard.
58	2-2-3-1	Test for unexpected interrupts.
5A		Display prompt "Press F2 to enter SETUP".
5C		Test RAM between 512 and 640k.
60		Test extended memory.
62		Test extended memory address lines.
64		Jump to UserPatch1.
66		Configure advanced cache registers.
68		Enable external and CPU caches.
6A		Display external cache size.
6C		Display shadow message.
6E		Display non-disposable segments.
70		Display error messages.
72		Check for configuration errors.
74		Test real-time clock.
76		Check for keyboard errors.
7C		Set up hardware interrupt vectors.
7E		Test coprocessor if present.
80		Disable onboard I/O ports.
82		Detect and install external RS232 ports.
84		Detect and install external parallel ports.
86		Re-initialize on-board I/O ports.
88		Initialize BIOSData Area.
8A		Initialize Extended BIOS Data Area.
8C		Initialize floppy controller.
90		Initialize hard-disk controller.
91		Initialize localbus hard-disk controller.
92		Jump to UserPatch2.
93		Build MPTABLE for multi-processor boards.
94		Disable A20 address line.
96		Clear huge ES segment register.
98		Search for option ROMs.
9A		Shadow option ROMs.

Code	Beeps	POST Routine Description
9C		Set up Power Management.
9E		Enable hardware interrupts.
A0		Set time of day.
A2		Check key lock.
A4		Initialize typematic rate.
A8		Erase F2 prompt.
AA		Scan for F2 keystroke.
AC		Enter SETUP.
AE		Clear in-POST flag.
B0		Check for errors.
B2		POST done - prepare to boot operating system.
B4		One beep.
B6		Check password (optional).
B8		Clear global descriptor table.
BC		Clear parity checkers.
BE		Clear screen (optional).
BF		Check virus and backup reminders.
C0		Try to boot with INT 19.
D0		Interrupt handler error.
D2		Unknown interrupt error.
D4		Pending Interrupt.
D6		Initialize option ROM error.
D8		Shutdown error.
DA		Extended Block Move.
DC		Shutdown 10 error.
		The following are for boot block in Flash ROM:
E2		Initialize the chipset.
E3		Initialize refresh counter.
E4		Check for Forced Flash.
E5		Check HW status of ROM.
E6		BIOS ROM is OK.
E7		Do a complete RAM test.
E8		Do OEM initialization.
E9		Initialize interrupt controller.
EA		Read in the bootstrap code.
EB		Initialize all vectors.
EC		Boot the Flash program.
ED		Initialize the boot device.
EE		Boot code was read OK.

Hard Disk Drive Types

D

The following table lists the IDE hard disk types supported by the Dual Fortress.

Type	Cylinders	Heads	Write Precomp	Sectors	Size
1	306	4	128	17	10
2	615	4	300	17	21
3	615	6	300	17	32
4	940	8	512	17	65
5	940	6	512	17	99
6	615	4	none	17	21
7	462	8	256	17	32
8	733	5	none	17	31
9	900	15	none	17	117
10	820	3	none	17	21
11	855	5	none	17	37
12	855	7	none	17	52
13	306	8	128	17	21
14	733	7	none	17	44
15	N/A	N/A	N/A	N/A	N/A
16	612	4	0	17	21
17	977	5	300	17	42
18	977	7	none	17	59
19	1024	7	512	17	62
20	733	5	300	17	31
21	733	7	300	17	94
22	733	5	300	17	31
23	306	4	0	17	10
24	612	4	305	17	21
25	612	2	300	17	10
26	614	4	none	17	21
27	820	6	none	17	42
28	977	5	none	17	42
29	1218	15	none	36	336
30	1224	15	none	17	159

Type	Cylinders	Heads	Write Precomp	Sectors	Size
31	823	10	512	17	71
32	809	6	128	17	42
33	830	7	none	17	50
34	830	10	none	17	72
35	1024	5	none	17	44
36	1024	8	none	17	71
37	615	8	128	17	42
38	1024	8	none	26	109
39	925	9	none	17	72

Appendix

E

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 diskette.

2) Reboot your system with the MS-DOS 6.X 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) Now you can run the FLASH utility. The filename should be "PHLASH.EXE." Type this filename at the A:> prompt (but don't include its extension), followed by a space and the BIOS ROM image's filename. This file will be included in the download and has a file length of about 131K or 262K. For example, to update the Dual Fortress to BIOS version 01, you would type:

> PHLASH DLFT_01.ROM   [ENTER]

4) After the update process has completed and the system reboots, verify that the new BIOS version appears on-screen. If you have problems during this process, or if you have questions about the procedure, please call Technical Support.

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

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

Appendix

F

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 buffering 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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