

**ALR**

FLYER 32LCT  
User's Guide

# Preface

The ALR Flyer 32LCT User's Manual provides the information necessary to install and operate your new ISA computer manufactured by Advanced Logic Research (ALR), Inc. This manual assumes you have some experience using IBM-type personal computers and are familiar with DOS operating systems. You should know how to use a standard keyboard and understand special keys (for example, CTRL). You can obtain background in these areas by referring to your DOS system documentation. Additional information is available in various instruction manuals for IBM PC, AT, and PS/2 systems, which you can purchase at your local bookstore.

---

## Chapters and Appendixes in This Manual

---

The ALR Flyer 32LCT User's Manual is organized as follows:

<b>Chapter 1, Introduction</b>	Describes the major components of the Flyer 32LCT.
<b>Chapter 2, Getting Started</b>	Lists the Flyer 32LCT components, describes how to properly unpack the system, hook up the monitor and keyboard, initialize the system with a DOS diskette and power-up the system.
<b>Chapter 3, Advanced BIOS Setup</b>	Provides complete instructions for changing your system configuration through the BIOS Setup and additional information on the "Flash" EPROM.
<b>Chapter 4, Standard System Configuration</b>	Describes the Flyer 32LCT system board, hard and floppy disk controllers, system board memory configuration and VGA controller.
<b>Appendix A, Error Messages</b>	Lists nonfatal error messages, their causes, and the appropriate remedy. This appendix also lists fatal system board beep codes.
<b>Appendix B, Disk Drive Characteristics</b>	Hard Lists the 49 drive types supported by the Flyer 32LCT systems.
<b>Appendix C, Standard System Specifications</b>	Lists the specifications for a standard Flyer 32LCT system.

---

## Conventions Used in This Manual

---

The following conventions are used in this manual:

**<Enter>**                      **<Enter>** means you press the Enter (↵) key. After you type a keyboard entry, you press the Enter key to execute the entry.

**Keyboard entries**              Boldface type is used to denote commands you are to type from the keyboard. In the following example, at the system prompt (A>), the system asks you if you want to proceed. Your keyboard entry in this example is Y (yes), which is shown in boldface type.

A>PROCEED WITH FORMAT (Y/N)? **Y**<Enter>

**Keyboard sequence**            When two or more keys must be pressed to perform a function, they appear hyphenated, and must be pressed in the order shown. All keys must remain pressed until the keyboard sequence is complete. For example:

**CTRL-C**

means you hold down the CTRL key first, then press the C key (CTRL-C generally ends a program).

**CTRL-ALT-DEL**

means you hold down the CTRL key first, then hold down the ALT key and press the DEL key. The CTRL-ALT-DEL sequence reboots the system.

**Typing commands**            You can enter commands in either upper- or lower-case letters. For example, typing:

A>**dir** <Enter>

is the same as typing:

A>**DIR** <Enter>

**Variables**                      Words within < > angle brackets are variables and can have many names.

**Options**                         Words or items within [ ] square brackets are options. Enter only one of the options from the list provided.

---

## Icon Definitions

---

Throughout this manual, you will see a number of icons flagging certain portions of text. The following explains the meaning of each icon.



**NOTE:** A helpful tip intended to assist you in setting up and operating your system.



**IMPORTANT:** Information of greater importance than a note, but ignoring this won't cause any damage.



**CAUTION:** Ignoring this icon could result in damage to your hardware.



**WARNING:** Failure to comply with this warning may result in possible bodily injury.

---

## Acronyms and Abbreviations

---

<b>BIOS</b>	Basic Input/Output System
<b>CMOS</b>	Complementary Metal-Oxide Semiconductor
<b>DOS</b>	Disk Operating System
<b>DRAM</b>	Dynamic Random Access Memory
<b>EPROM</b>	Erasable Programmable Read-Only Memory
<b>I/O</b>	Input/Output
<b>ISA</b>	Industry Standard Architecture
<b>LAN</b>	Local Area Network
<b>P/N</b>	Part Number
<b>POST</b>	Power-On Self Test
<b>RAM</b>	Random Access Memory
<b>RMA</b>	Return Material Authorization

# Chapter 1

## Introduction

The ALR Flyer 32LCT is an economical powerhouse, designed in a sleek, tower-style chassis, geared for entry-level fileserver use. It is an extension of ALR's modular design, in an Industry Standard Architecture (ISA), allowing powerful upgrade paths and ensuring longevity.

The Flyer 32LCT is equipped with one of three CPU modules, each using Intel's new clock doubler technology. Among the Flyer 32LCT's high-performance features are a

256-KB cache module (standard on some systems), a 32-bit memory and CPU bus with a 16-bit I/O bus, an integrated high-performance VGA interface with 512-KB (1-MB standard on certain systems) video RAM, an integrated intelligent device electronics (IDE) hard disk interface as well as a floppy interface supporting both 3.5- and 5.25-inch floppy drives. A 3.5-inch 1.44-MB floppy disk drive is included, along with a choice of 120-, 340-, and 535-MB hard drives. Dual 60-, 120-, or 200-MB hard drives are also available with certain systems.

The sturdy chassis can accommodate twelve storage devices. Multiple quiet cooling fans and a 300-watt power supply help drive this machine. The power on/off switch, hardware reset control, and keyboard inhibit button are featured on the front panel, making these controls easily accessible.

Security features include hardware security locks, power-on user password and super-visor password support, and flash programming security.

This feature-filled system, along with its low cost, make it an ideal entry-level fileserver for the small business environment.

---

## Components and Performance Features

---

Figure 1-2 shows the major components inside the Flyer 32LCT. The following subsections describe some of these major components.

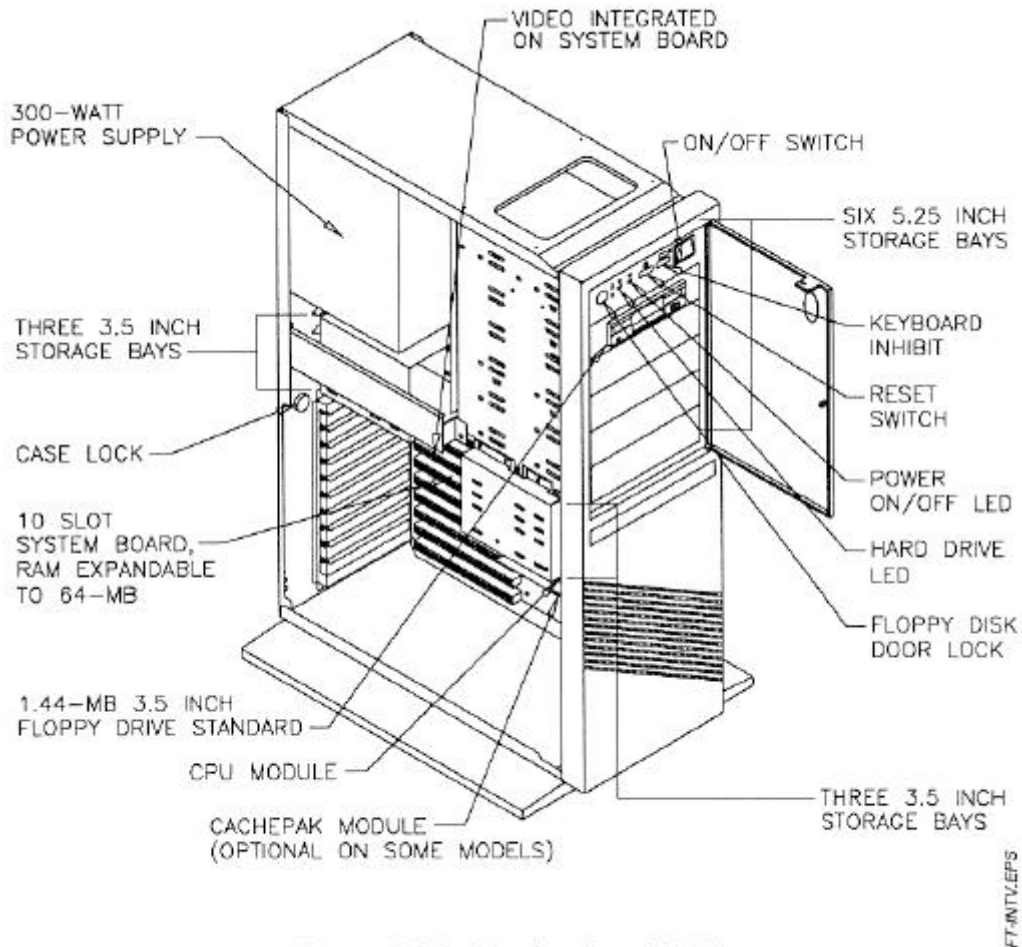


Figure 1-2: Inside the Flyer 32LCT

### Memory

The standard Flyer 32LCT contains 4-MB (8-MB on models with hard drives) of memory with a maximum on board expansion to 64-MB using 4-MB x 36 Single Inline Memory Modules (SIMMs).

### Floppy Drives and Controller

The Flyer 32LCT comes standard with a 3.5-inch 1.44-MB floppy drive. The floppy controller is integrated on the system board and supports up to two removable media storage devices.



**Hard Disk Drives and Controller**

The Flyer 32LCT systems come standard with 120-MB (<16-ms), 340-MB (<15-ms), or 535-MB (<12-ms) 3.5-Inch IDE hard disk drive for Model 12ODW, 340DW, and 535DW, respectively. These drives are special AT-interface drives that contain controller functions. In addition, the controller functions can accommodate up to two hard disk drives in your system.

The 4/66d MULTUS system is supplied with dual 60-MB (<19-ins), 120-MB (<16-ins), or 200-MB (<16-ins) hard disk drives using the MULTUS controller.

**Available Storage Bays**

The Flyer 32LCT chassis can accommodate six half-height 5.25-inch accessible devices as well as six low-profile internal drives.

**Video**

The Flyer 32LCT comes equipped with an embedded 16-bit high-performance SuperVGA (Video Graphics Array) controller. The Flyer 32LCT integrated video adapter contains 512-KB (1-MB standard on certain systems) of video memory.

**Expansion Slots**

The Flyer 32LCT has two proprietary expansion slots reserved for the CPU and cache modules. Eight slots are capable of supporting full-length 8- or 16-bit ISA boards and two support half-length boards.

**BIOS EPROM**

The Basic Input/Output System (BIOS) from Phoenix Technologies Ltd. controls the input/output (I/O) devices in the system. The I/O protocol for peripheral devices such as terminals, printers, and scanners is completely IBM-compatible. The BIOS EPROM also provides the BIOS SETUP program, one of the two ways the Flyer 32LCT can be con-figured.

An additional feature of the BIOS allows you to activate the BIOS SETUP program by pressing simultaneously the CTRL-ALT-ESC keys at the DOS prompt, or if the system's setup configuration is incorrect, the system prompts you to press the F2 key.

The Flyer 32LCT also incorporates a “Flash” EPROM. This new technological marvel allows you to upgrade your BIOS through software alone. Never again will you have to open your system and gingerly pry a delicate chip from the board, invariably bending or breaking its delicate pins.

For basic information on the BIOS SETUP program refer to Chapter 2 of this manual. More advanced features such as enabling password support and further information on the “Flash” EPROM or reprogrammable BIOS can be found in Chapter 3, “Advanced BIOS Setup.”

### **Security**

Among the security features included with Features the Flyer 32LCT are three hardware security locks: one for the chassis, one for the front bezel cover disallowing access to the drives, and one for the keyboard inhibiting use of the keyboard; power-on user and supervisor passwords; and programming security through the flash EPROM.

### **Keyboard**

The Flyer 32LCT system includes an enhanced 101-key IBM AT-compatible keyboard with a long interface cable. This cable enables you to place the keyboard at a convenient distance from the system unit.

### **Standard Software**

The Flyer 32LCT is compatible with AT software application packages. Video drivers for selected applications are also included in the standard software package. Please see the README files on the diskettes for current information concerning the Flyer 32LCT video drivers.

The Flyer 32LCT is compatible with all versions of MS-DOS® and IBM PC-DOS™, IBM OS/2™, MS OS/2®, UNIX®, XENIX®, and Novell NetWare™. However, the BASIC and BASICA software from IBM PC-DOS will not run because they require BASIC support in the BIOS and thus, will run only on IBM systems. We do include QBASIC in our MS-DOS option; this provides the same function as BASICA (QBASIC is written by Microsoft).

# Chapter 2

## Getting Started

The following sections describe how to:

- Properly unpack your Flyer 32LCT system
- Connect your monitor and keyboard
- Power up the system
- Prepare the hard disk drive for an operating system

---

## Unpacking

---

Follow the guidelines listed below for unpacking your system:

1. Prepare a flat, hard surface for your computer. Allow at least three inches at the rear of the chassis for cabling and free air circulation.
2. Keep your computer shielded from extremes in temperature and humidity. Avoid direct sunlight, heater ducts, and other hot areas.
3. Invest in a 3-prong, 115-volt AC surge control outlet station. The Flyer 32LCT requires one outlet; however, future expansion is easier if other outlets are readily available. A surge control station is recommended for protection against AC line spikes.
4. Keep your system away from equipment that generates magnetic fields. Even a telephone placed too close to the computer can interfere with it.
5. Keep the special carton and foam that protects your computer during shipment for any future transportation.

---

## Connecting the Monitor and Keyboard

---

The keyboard and optional FlexVIEW 3X monitor must be connected to the system I/O (input/output) connectors via cables. The use of a shielded and properly grounded interface cable(s) is required to comply with FCC regulations.

Figure 2-1 shows the rear of the Flyer 32LCT chassis and identifies the various I/O connectors. Optional equipment connections include the parallel, mouse, and two serial ports, as well as the ten internal expansion slots.

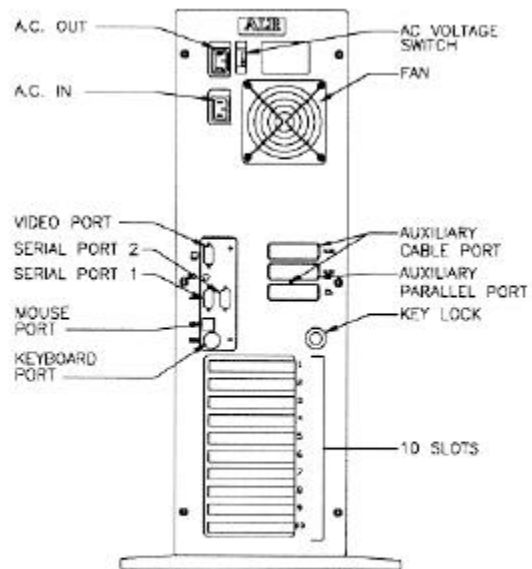


Figure 2-1: Rear of the Flyer 32LCT

The keyboard should be plugged into the keyboard port. The monitor should be connected to the video port, as illustrated in Figure 2-2.

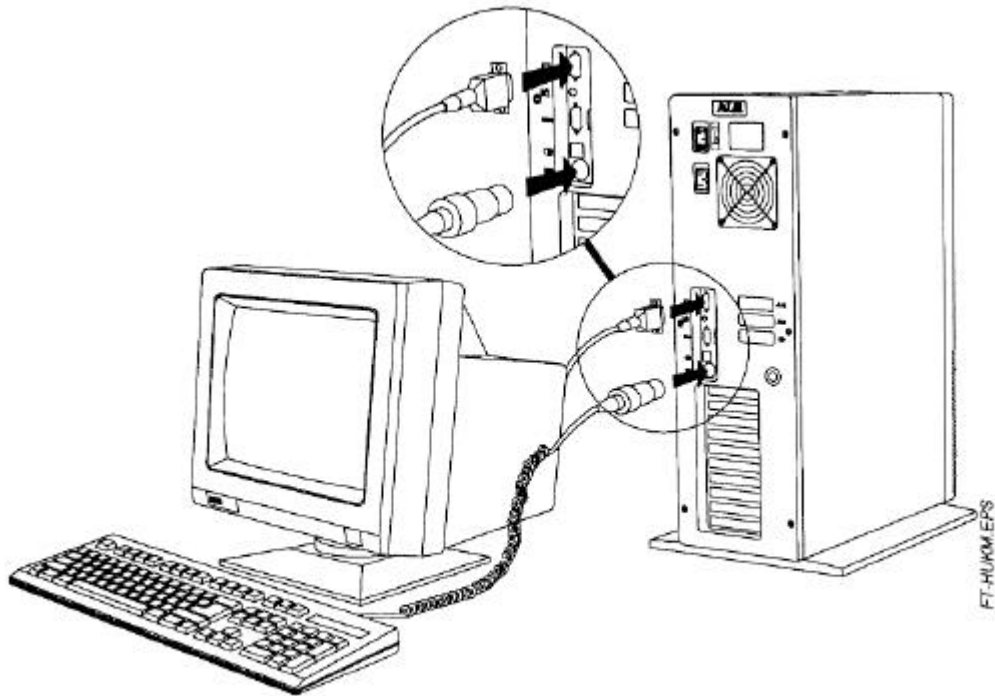


Figure 2-2: Hooking up the Keyboard and Monitor



**IMPORTANT:** In order to comply with the requirements of the German Ergonomic Standard ZHI/6 18, only a monitor with such approval must be used.

---

## Powering Up the System

---



**CAUTION:** Make sure the AC voltage switch located on the rear of the Flyer 32LCT is set to the correct voltage. For example, in the United States, set the switch for 115 volts. Refer to Figure 2-1 for the location of the AC voltage switch.

1. Turn the power ON by pressing the power on/off switch, as illustrated in Figure 2-3. The green LED (power status indicator) will light when power is on. Then turn the monitor power ON.

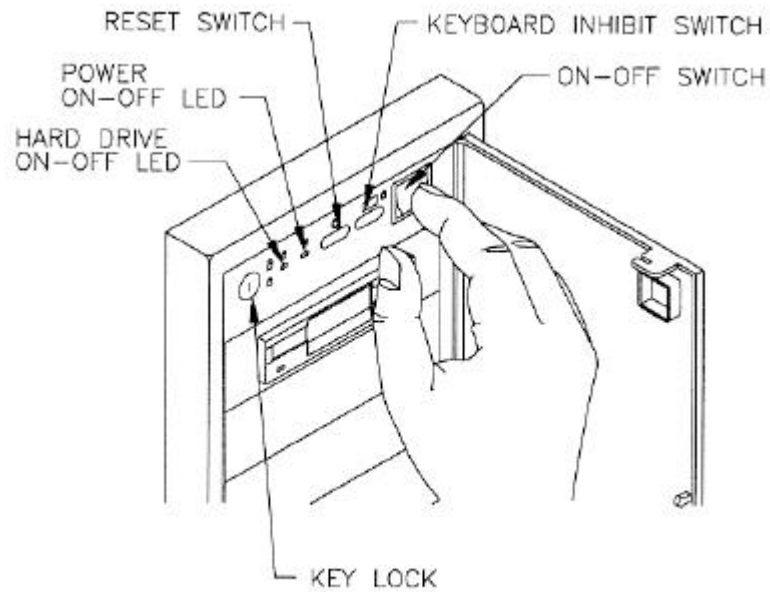


Figure 2-3: Power On/Off Switch

On power-up, the Flyer 32LCT checks its system memory, even if the monitor isn't on. The time it takes your system to perform the memory check depends on the amount of system memory. The monitor displays a power-up message, similar to the one shown on Figure 2-4.

```
Phoenix 80486 ROM BIOS Plus Version x.xx.xx  
Copyright (C) 1985-1989 Phoenix Technologies Ltd.  
All Rights Reserved
```

```
Advanced Logic Research, Inc.  
Flyer 32LCT
```

```
<640K> Base Memory, <3456K> Extended
```

Figure 2-4: Power On Message

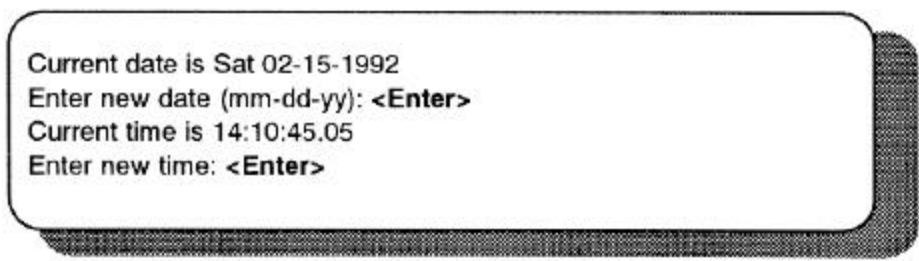
If the system fails the memory test, the monitor displays an error message preceded by two beeps.

If the video adapter is not initialized when the error occurs, a beep code signals the error message.

Appendix A lists the power-on self-test (POST) error messages. Most messages are nonfatal or offboard failures.

If a fatal error message occurs, contact your ALR reseller for field service support. Do not return any equipment to the factory without obtaining a Return Material Authorization (RMA) number. The RMA number must be written clearly on the carton.

2. Insert your DOS diskette in Drive A and press F1 to reboot the system. The system responds with the following:



If the date or time is incorrect or if the system powers up with the message **INVALID CONFIGURATION INFORMATION**, run the BIOS SETUP program (described in the following section) to make corrections.



**NOTE:** This procedure is to be followed the first time you boot up your Flyer 32LCT Model 1 system. If you install a hard drive, you must configure it through the BIOS SETUP program and then prepare the hard disk for the operating system you plan to use. At that time, you can set your system to automatically boot from the hard drive.



---

## Basic BIOS Setup Program

---

You can invoke the BIOS Setup Program by simultaneously pressing **CTRL-ALT-ESC** at the DOS prompt. The following menu screen will appear.

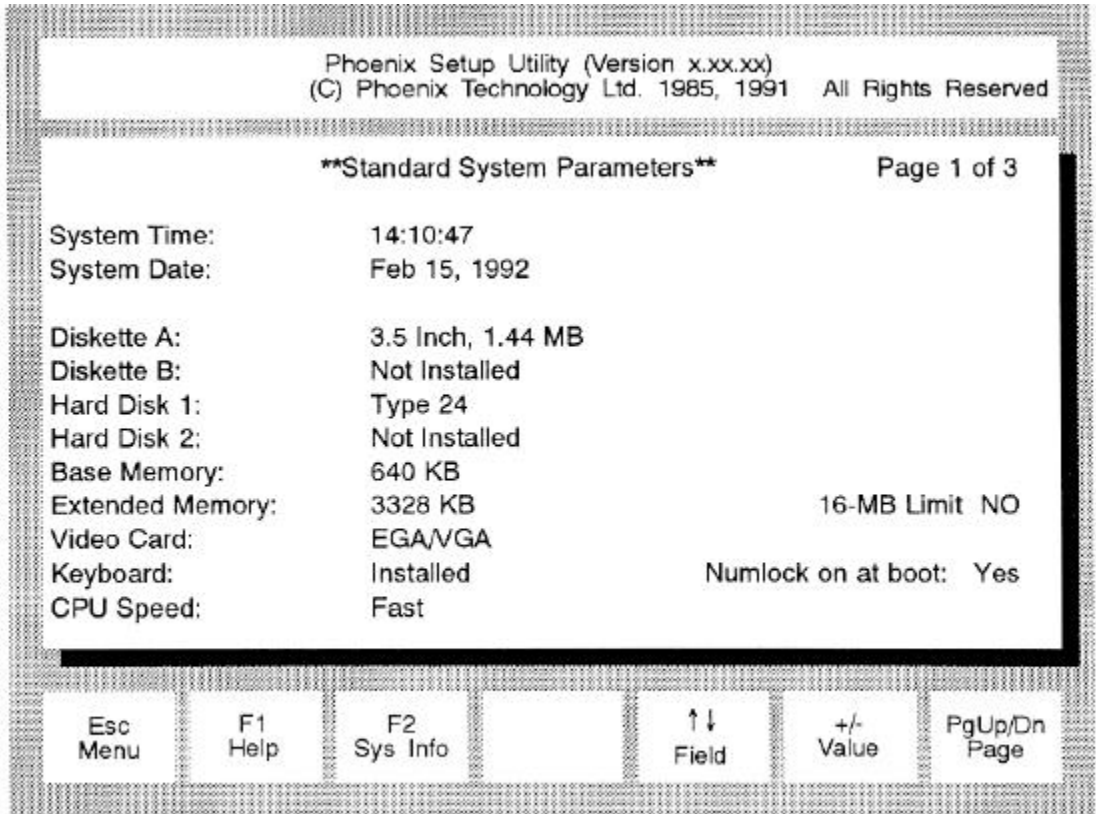


Figure 2-5: Main BIOS Setup Screen

Verify that the configuration information displayed on the first **SETUP** screen reflects your current configuration. You can use the **Up** (**↑**) and **Down** (**↓**) arrow keys to highlight any incorrect information. Use the **Plus** (**+**) and **Minus** (**-**) keys to change the highlighted parameter. Pressing the **F1** key will provide you with help information as you make your changes.

Once you have made the appropriate changes, press **ESC** to exit the Setup screen. You must then press **F4** to record the information in CMOS and reboot the system.

Pressing **ESC** followed by **F6** will exit the **SETUP** program without changing your current configuration.



**IMPORTANT:** In order for your configuration changes to be recorded, you must press **ESC** and then **F4** to allow your system to reboot. Pressing **F6** or simply turning off your system will cause all your changes to be lost.

More comprehensive information for the BIOS Setup program can be found in Chapter 3, “Advanced BIOS Setup.”

---

## Preparing the Hard Disk

---

Your hard drive may have been formatted at the factory. If this is not the case, or your system does not boot from the hard drive when you apply power, follow the procedure below.

You must initialize the hard disk drive to prepare it as a DOS system. To initialize the hard disk, you will use the DOS commands, FDISK and FORMAT. These commands are explained briefly below - for further details refer to your DOS manual. Use the following procedures to partition and format the hard disk. **These procedures should only be followed the first time you use your system, or after a low-level format.**

### Partition the Hard Disk Drive Using FDISK

If you have not already done so, insert your DOS diskette in Drive A and boot the system by entering:

**F1** (F1 = function key)

To partition the drive, enter:

**A>FDISK <Enter>**

The FDISK program displays a series of menus to help you partition your hard disk for MS-DOS. This feature allows you to divide your drive into several smaller “drives.” If you are using DOS 3.3 or earlier, you must have at least two partitions. With later versions of DOS, you can define the entire drive as a single partition.

The system reboots after it completes the FDISK program. If the system does not allow you to complete the FDISK procedure, make sure the system setup information is correct. More specifically, you need to make sure the drive type is correct. A label indicating the appropriate drive type is attached to the ALR hard drive.



**NOTE:** The hard disk drive is low-level formatted at the factory — you should use the low-level format procedure only if your hard disk drive has crashed. (If your hard disk drive has crashed, you normally receive the error message, “Hard Disk Failure.”)

**Initialize the Hard Drive**

With the DOS diskette still inserted in Drive A, format the hard disk by entering:

**A>FORMAT C:/S <Enter>**

This will format the drive and transfer the DOS system files required for booting. You can now boot the hard disk drive. To verify that it is bootable, open the door to Drive A: and reboot the system by entering:

**CTRL-ALT-DEL** (DELETE key)

The DOS system prompt is displayed from Drive C as

C>

Your Flyer 32LCT hard disk system is now ready to run DOS applications.

If you wish to prepare your hard disk for other operating systems such as OS / 2, UNIX, XENIX or Novell, refer to the documentation supplied with your operating system software.

---

**Logging Hard Disk Drive Characteristics**

---

ALR recommends that you run the SETUP program to check characteristics of the hard disk installed in your system. Knowing your drive configuration helps if you must set up the system after a crash that destroys the contents of the CMOS RAM. If your system loses its configuration information, check the label on the drive for the drive type or call your dealer.



**NOTE:** You should paste a label on your system listing any configuration changes for future reference.

# Chapter 3

## Advanced BIOS Setup

The Phoenix AT-compatible BIOS SETUP program sets the contents of the battery-powered CMOS RAM that stores system configurations. It includes the useful addition of a table listing 49 hard disk drive characteristics supported by the Flyer 32LCT (see Appendix B). The SETUP program also provides the following features:

- checks the conventional and extended memory and reports its capacity
- recalculates CMOS data and checksums
- shows the presence of a coprocessor (if installed)
- displays a message if the video configuration is wrong
- provides a password support feature

Use the following keys to control the BIOS SETUP program:

- **Up**(↑) and **Down** (↓) arrow keys to move the shaded cursor to the appropriate option
- **Plus** (+) and **Minus** (-) keys to scroll through the selections and select the appropriate configuration
- **F1** to get help regarding the current entry and to scroll forward from one help screen to the next
- **PgUp** and **PgDn** keys to toggle between the three SETUP screens

- **ESC** key to open the Exit Setup window with the following choices:
  - **F4** to save values and reboot
  - **F5** to load default values
  - **F6** to abort SETUP without saving

**After running the SETUP program, you must boot the system by selecting F4 so that the configurations you've just set can be recorded in CMOS.** If you power down instead of rebooting, the data you've just entered will not be recorded.

### **Activating the SETUP Program**

To activate the SETUP program, press **CTRL-ALT-ESC** at the DOS prompt.

The Flyer 32LCT BIOS SETUP program is displayed on three screens. When you activate the BIOS SETUP program, the system responds with the Main SETUP Screen shown in figure 3-1:

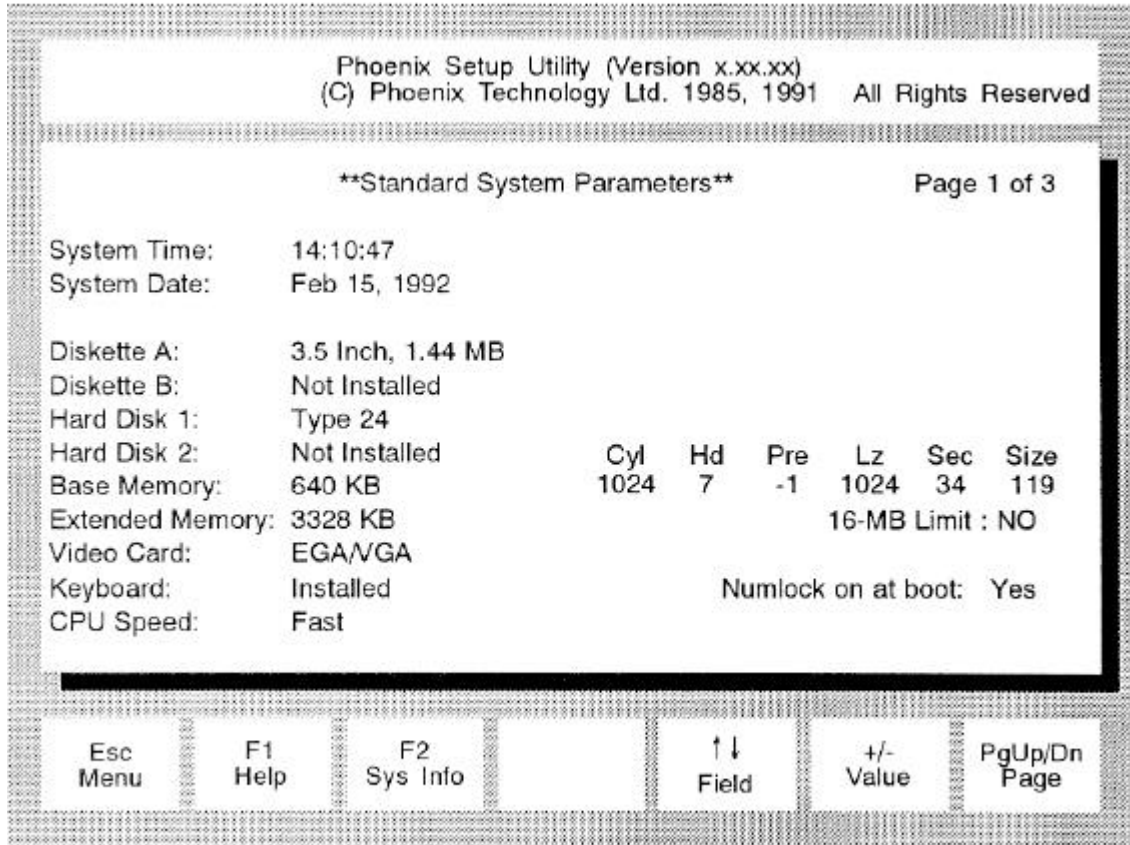


Figure 3-1: Main BIOS Setup Screen

The following list provides the selections available for each option:

*Time:* Hour:Minute:Second  
(HH:MM:SS)

*Date:* Day Month Date, Year  
(day-of-week is automatic)

*Diskette A:* Not Installed  
5.25-Inch, 360-KB  
5.25-Inch, 1.2-MB  
3.5-Inch, 720-KB  
3.5-Inch, 1.44-MB

*Diskette B:* same selections as for Diskette A

*Hard Disk 1:* Not Installed  
Type <1 - 49>1 (press F1 twice for a list)

*Hard Disk 2:* same selections as for Hard Disk 1

<i>Base Memory:</i>	automatically configured <sup>2</sup>
<i>Extended Memory:</i>	automatically configured <sup>2</sup>
<i>16-MB Limit</i>	Yes <sup>3</sup> No
<i>Video Card:</i>	Not Installed EGA/VGA CGA40 CGA80 MONO
<i>Keyboard:</i>	Not Installed Installed
<i>CPU Speed:</i>	Fast - No slow down Slow - Slowing circuits enabled
<i>Numlock on at boot:</i>	Yes No

<sup>1</sup> Selecting Drive Type 1 enables the auto-configure feature which examines installed devices to determine their type and configures the system automatically. Drive types 48 and 49 are user-definable; you can change the parameters to match your drive specification. Drive Types 2-47 provide pre-defined options to choose from.

<sup>2</sup> Detected by the system. You may not make any entries in this field.

<sup>3</sup> Some software packages do not properly recognize RAM memory in excess of 16-MB. The 16-MB Limit feature, when activated, prevents a program from detecting more than 16-MB of memory without reducing your system's actual memory resources. This feature is normally not required and should be left set to the NO setting unless needed.



The second SETUP Screen provides the Embedded Feature Control used to configure the floppy and hard disk controllers and I/O ports:

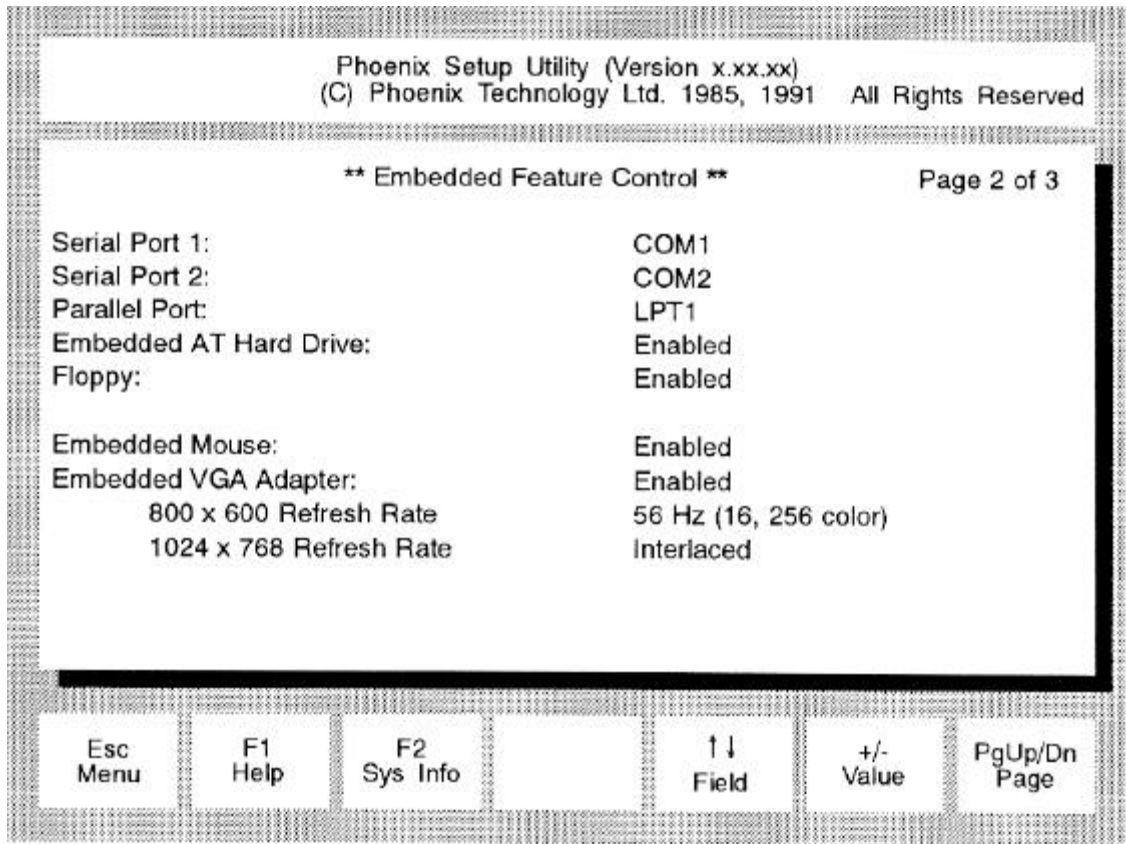


Figure 3-2: Second BIOS SETUP Screen

The selections for each Embedded Feature Control are:

- Serial Port 1:* COM1  
COM2  
DISABLED
- Serial Port 2:* COM1  
COM2  
DISABLED
- Parallel Port:* LPT1  
LPT2  
LPT3  
DISABLED
- Embedded AT Hard Drive Controller:* ENABLED  
DISABLED

<i>Floppy:</i>	ENABLED DISABLED
<i>Embedded Mouse:</i>	ENABLED DISABLED
<i>Embedded VGA Adapter:</i>	ENABLED DISABLED
<i>800 x 600 Refresh Rate:</i>	56 Hz (16, 256 color) 60 Hz (16, 256 color) 72 Hz (16, 256 color)*
<i>1024 x 768 Refresh Rate:</i>	60Hz non-Interlaced 70 Hz non-Interlaced* 72 Hz non-Interlaced (16, 256 color)* Interlaced

\* The ALR FlexVIEW 3X monitor does not support these modes.



**NOTE:** If you experience compatibility problems, try an option other than the default mode.

A third BIOS SETUP screen can be accessed by using the **PgUp** or **PgDn** keys. This screen offers security features that allow you to upgrade the data stored in the “Flash” EPROM and enable password support.

Figure 3-3 illustrates the third BIOS SETUP screen.

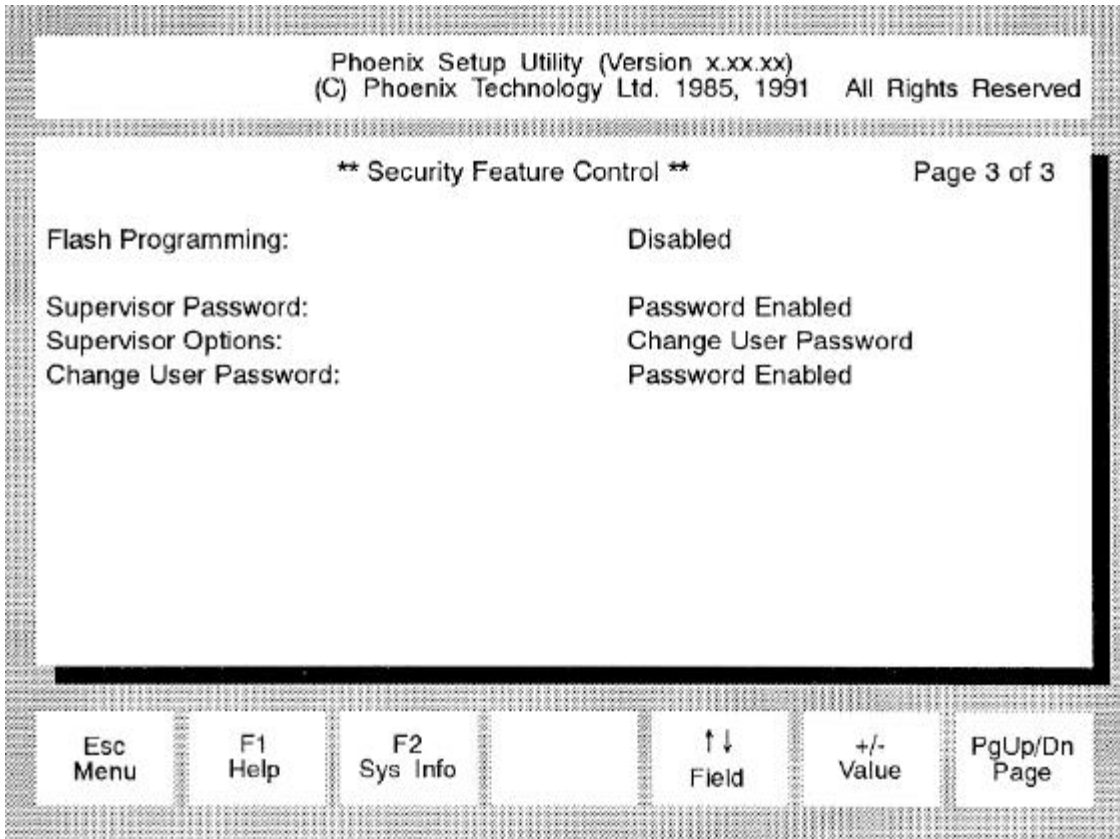


Figure 3-3: Third BIOS SETUP Screen

The options available on the third BIOS SETUP screen are as follows:

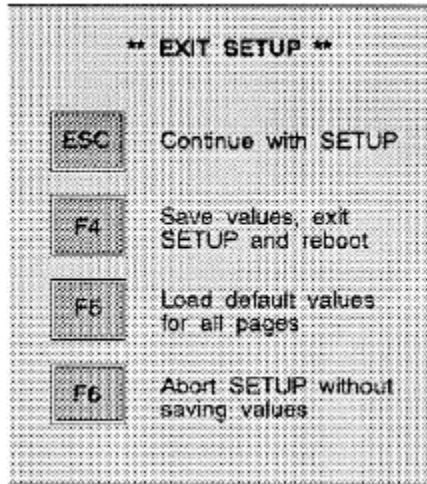
- |                       |   |
|-----------------------|---|
| Flash Programming:    | ENABLED*<br>DISABLED  |
| Supervisor Password:  | PASSWORD DISABLED<br>ENTER PASSWORD   |
| Supervisor Options:   | CHANGE USER PASSWORD<br>ENABLE USER PASSWORD<br>DISABLE USER PASSWORD<br>CHANGE SUPERVISOR PASSWORD |
| Change User Password: | PASSWORD DISABLED<br>ENTER OLD PASSWORD<br>ENTER NEW PASSWORD                                       |

If you wish to enable password support, follow the instructions later in this chapter.

\*Must be “ENABLED” to be able to download new BIOS information. If you are required to upgrade the “Flash” EPROM, the README file (included with the upgrade software) contains important Information to keep in mind when upgrading your system’s Flash BIOS.

### **Saving Configuration Changes**

After making changes to any of the BIOS Setup screens, pressing **ESC** will prompt you with the following message window:



You are provided with the following options:

- ESC:** Removes the message window and returns to Setup.
- F4:** Saves the new values you selected and records them in the CMOS RAM. Your system will automatically reboot with your changes in effect.
- F5:** Loads default configuration values for all the SETUP screens.
- F6:** Exits SETUP without saving any of your changes.

---

## Password Support

---

Your Flyer 32LCT is capable of supporting supervisor and user passwords. This section describes the features that are supported and explains how to use this new password support.

### Features

The following are supported features of the Password Support function of the BIOS Setup.

- Supports User Password of up to 7 alphanumeric characters (defaults to no password)
- Supports Supervisor Password of up to 7 alphanumeric characters (defaults to the string “power”)
- Supports Supervisor Options which include:
  - Enable user password
  - Disable user password
  - Change user password
  - Change supervisor password

### How to Access and Use Password Support

All password support options are accessed through the third screen of the SETUP program, which is activated by pressing the **CTRL-ALT-ESC** keys. There are three password support options on the SETUP screen:

Supervisor Password

Supervisor Options

Change User Password

Each option has several different selections that you may scroll by using the **Plus (+)** and **Minus (-)** keys.

Your Flyer 32LCT is shipped in “unprotected” mode (that is, no password is required to access the system). The following sections describe how to access and use Flyer 32LCT password support in order to place your machine in a “protected” mode (that is, a user/supervisor password is required to access the system).

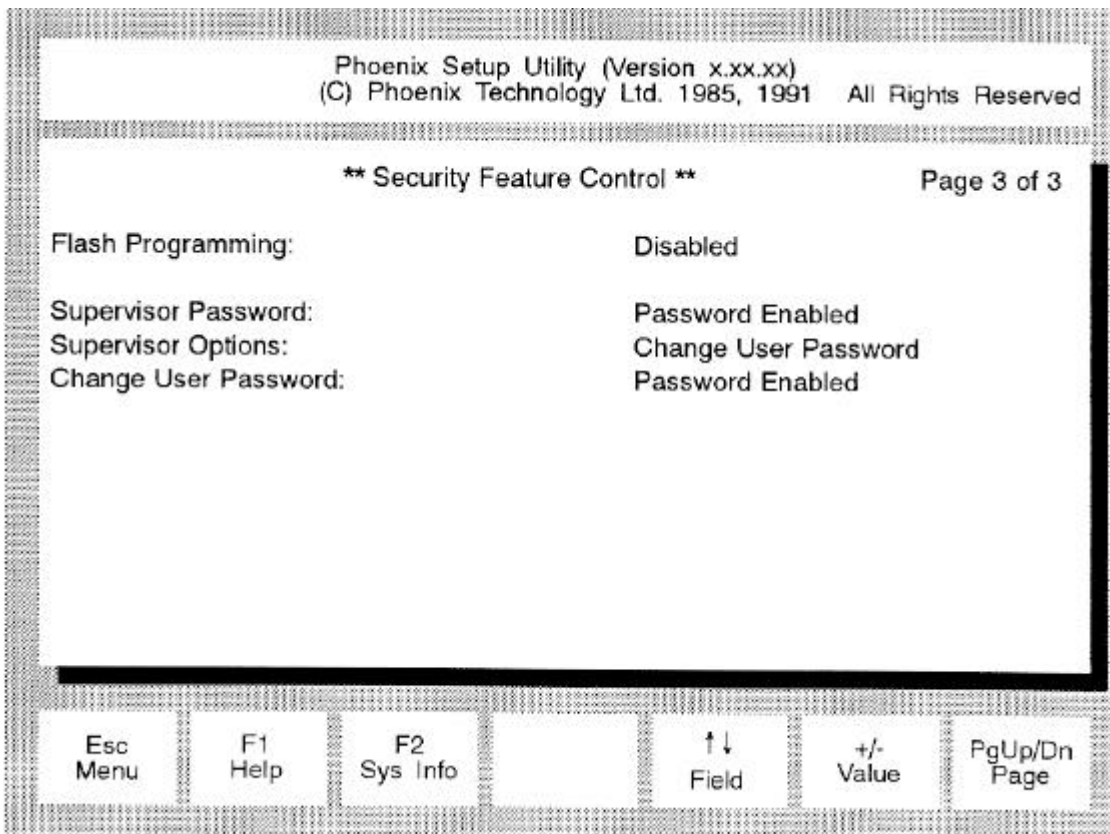


**NOTE:** When Supervisor Option: Disable User Password is selected, all password security is disabled until Enable User Password is selected.

### Establishing a User Password

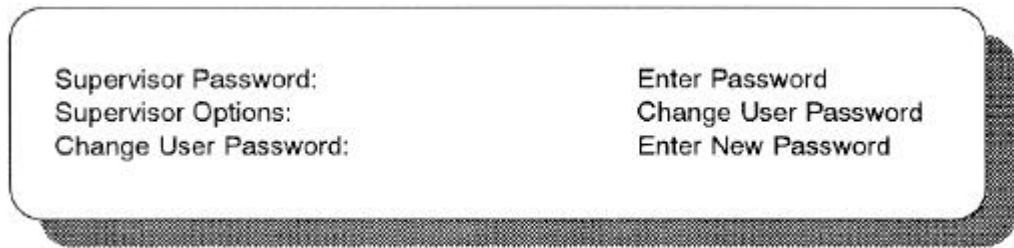
When your system arrives, there will be no user password (the default is no password). You can establish the initial user password through the SETUP program as follows:

1. Activate the SETUP program by **pressing CTRL-ALT-ESC**.
2. Press the **PgUp** or **PgDn** keys twice to access the third SETUP screen. The Security Features Control screen is displayed:



3. Use the **Up** (↑) or **Down** (↓) arrow keys to move the cursor to the **Supervisor Options:** option.
4. Use the **Plus** (+) or **Minus** (-) keys to scroll to the **Enable User Password** selection and press **<Enter>**.

The **SETUP** screen password support options will now display the following selections:



5. Use the **Up** (↑) or **Down** (↓) arrow keys to move the cursor to the **Change User Password:** option.
6. Type the password you want to use and press **<Enter>**. The screen displays asterisks (\*) for each character that you type in.



**NOTE:** The password may have from 4-7 alphanumeric characters (spaces are not allowed) and is not case-sensitive. For example, if you type the password as “MERMAID” now, and later you type the password as “mermaid” or “Mermaid,” the system will still recognize the password.

If the password that you typed is invalid (for example, more than 7 characters), the system responds with:

**INVALID Password**

If the password that you typed is valid, the system responds with:

**Password Accepted**

7. Press the **ESC** key to automatically reboot the system. (There is no need to enter the old password when you are establishing the initial password.)

8. Once your system reboots you will be prompted to enter your password. Type in the password you created in step 6. If you type in an invalid password, you will be notified of the error and requested to re-enter the password.



**NOTE:** The system allows you to make mis-takes seven (7) times before locking up. If the system locks up, you will have to turn the system OFF and then turn it ON again.

Once you do type in the correct password and it is accepted, your system completes the booting sequence.

9. Type the new date and press **<Enter>**. The DOS prompt will appear and you can continue as usual.

### Changing a User Password

The SETUP program provides two options for changing a user password.

- Change User Password: Enter Old User Password
- Supervisor Options: Change User Password

A typical user (that is, a person not signed on as a supervisor) must use the **Change User Password:** option. This option requires that the user's "old" password be entered first. This procedure is explained below.

A supervisor (that is, a person signed on with the supervisor password) can change a user password without knowing the "old" password through the **Supervisor Options: Change User Password** option (refer to "Using Supervisor Options" for detailed information on this procedure).

As a typical user, you can change a user password through the SETUP program as follows:

1. Activate the SETUP program by pressing CTRL-ALT-ESC. Press PgUp or PgDn until the third SETUP screen is displayed.
2. Use the **Up** (↑) or **Down** (↓) arrow key to move the cursor to the **Change User Password:** option.



3. Use the **Plus (+)** or **Minus (-)** keys to scroll to the Enter Old Password selection.
4. Enter your “old” password, as requested and press **<Enter>**.

The system will then display the Enter New Password selection.

5. Enter your “new” password, as requested and press **<Enter>**.

If either the “old” or “new” password that you typed is invalid (for example, more than 7 characters), the system responds with:

INVALID Password

If your password is accepted, the system responds with:

Password Accepted

6. When the system accepts your new password, press the **ESC** key to exit the SETUP screen.

## Establishing a Supervisor Password



When your system arrives, the supervisor password default will be “power.” You can accept the default password or establish a different supervisor password through the SETUP program.

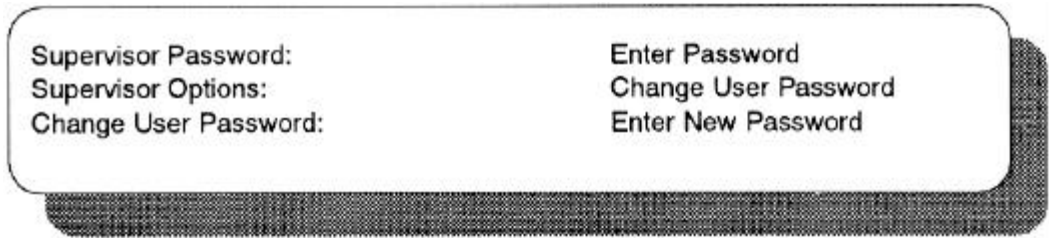
**NOTE:** Once user and supervisor passwords have been established, your system is in “protected mode” and either the user password or supervisor password must be entered to gain access to the system. If, in the unlikely event that the user and the supervisor both forget their passwords, call your authorized ALR dealer for information.

To establish a different supervisor password, follow the procedure below:

1. Activate the SETUP program by pressing the **CTRL-ALT-ESC** keys. Press the **PgUp** or **PgDn** keys until the third SETUP screen is displayed.
2. Use the **Up (↑)** or **Down (↓)** arrow keys to move the cursor to the **Supervisor Options:** option.

- Use the **Plus (+)** or **Minus (-)** arrow keys to scroll to the Enable User Password selection and press <Enter>.

The SETUP screen will now display the following selections:



- Use the **Up (↑)** or **Down (↓)** arrow keys to move the cursor to the Supervisor Password: option.
- Type the password “power” and press <Enter>. The screen displays asterisks (\*) for each character that you type in and then displays the message:

Password Accepted

- Use the **Up (↑)** or **Down (↓)** arrow keys to move the cursor to the Supervisor Options: Option.
- Use **Plus (+)** or **Minus (-)** keys to scroll to the Change Supervisor Password selection and press <Enter>. The system responds:

Enter New Password

- Type the password you want to use and press <Enter>. The screen displays asterisks (\*) for each character that you type in.



**NOTE:** Passwords may have from 4-7 alphanumeric characters (spaces are not allowed) and is not case-sensitive. For example, if you type the password as “MERMAID” now, and later you type the password as “mermaid” or “Mermaid,” the system will still recognize the password.

If the password that you typed is invalid (for example, more than 7 characters), the system responds with:

## INVALID Password

If the password that you typed is valid, the system responds with:

### Password Accepted

9. Press the ESC key to automatically reboot the system.

When the system has rebooted you will be requested to enter your password.

10. Type in the password you created in step 8. If you type in an invalid password, you will be notified of the error and requested to re-enter the password.



**NOTE:** The system allows you to make mistakes seven (7) times before locking up. If the system locks up, you will have to turn the system OFF and then turn it ON again. Once you do type in the correct password and it is accepted, the following message is displayed:

\*\*\*Password Accepted\*\*

11. Type the new date and press <ENTER>. The DOS prompt will appear and you can continue as usual.



**NOTE:** When you have signed on as a supervisor, the Supervisor Options: option will be available. This option is not accessible if you are not signed on as a supervisor. The next section “Using Supervisor Options” describes all supervisor options and how they are performed.

## Using Supervisor Options

When a supervisor logs onto the system using the supervisor password, the following Supervisor Options: become available:

- Change User Password
- Disable User Password
- Enable User Password
- Change Supervisor Password

The following sections describe how to access and use the Flyer 32LCT password support as a supervisor. All supervisor options are performed through the SETUP program:

1. Activate the SETUP program by pressing **CTRL-ALT-ESC**. Press the **PgUp** or **PgDn** keys until the third SETUP screen is displayed.
2. Use the **Up** (↑) or **Down** (↓) arrow keys to move the cursor to the **Supervisor Options:** option.

### Change User Password

1. Use the **Up** (↑) or **Down** (↓) arrow keys to move the cursor to the **Supervisor Options:** option.
2. Use the **Plus** (+) or **Minus** (-) keys to scroll to the **Change User Password** selection.
3. Press **<Enter>**. The system responds with the following:

Enter New Password

4. Type in the new password. The system responds with the following:

Password Accepted

5. Press **ESC** to reboot the system.



**NOTE:** Notice that the system does not re-quire the entry of the user's "old" password as it does in the **Change User Password:** option. This is done so that the supervisor can change a user's password without knowing their "old" password; for example, in the case of an employee who has forgotten his/her password, or for an employee who has left the company.

**Disable User Password**

1. Use the **Up** (↑) or **Down** (↓) arrow keys to move the cursor to the Supervisor Options: option.
2. Use the **Plus** (+) or **Minus** (-) keys to scroll to the Disable User Password selection.
3. Press <**Enter**>. The system responds with the following:

User Password Disabled

4. Press ESC to reboot the system.



**NOTE:** When Disable User Password is selected, all password security (user and supervisor) is disabled. When you reboot the system, it is in an unprotected mode, and all password support is suspended and remains so until Enable User Password is selected.

**Enable User Password**

When Disable User Password has been selected, all password security (user and supervisor) is disabled. This means that the system is in an unprotected mode, and all password support is suspended and remains so until Enable User Password is selected. Any user (not just a supervisor) can enable the user password by following the procedure below:

1. Use the **Up** (↑) or **Down** (↓) arrow keys to move the cursor to the Supervisor Options: option.
2. Use the **Plus** (+) or **Minus** (-) keys to scroll to the Enable User Password selection.
3. Press <**Enter**>. The system responds with the following:

Password Enabled

4. Use the **Up** (↑) or **Down** (↓) arrow keys to move the cursor to the Change User Password: option.
5. Type In the new password.
6. Press ESC to reboot the system.

**Change Supervisor Password**

1. Use the **Up** (↑) or **Down** (↓) arrow keys to move the cursor to the **Supervisor Options:** option.
2. Use the **Plus** (+) or **Minus** (-) keys to scroll to the **Change Supervisor Password** selection.
3. Press <**Enter**>. The system responds with the following:

**Enter New Password**

4. Type in the new supervisor password. The system responds with the following:

**Password Accepted**

5. Press **ESC** to reboot the system.



**NOTE:** When changing a supervisor password, be sure to make a mental note of the change. Once user and supervisor passwords have been established, your system is in protected mode and either the user password or supervisor password must be entered to gain access to the system. In the unlikely event that both the user and the supervisor forget their passwords, call your authorized ALR dealer for information.

---

## Reprogrammable BIOS

---

The Flyer 32LCT incorporates a “Flash” EPROM or reprogrammable BIOS. Before explaining just what a “Flash” EPROM is, it may be useful to understand what a standard EPROM is and how it works.

EPROM stands for Erasable Programmable Read-Only Memory. This unique chip can have data stored in it, have the data erased and have new data recorded in its place. However, in order to erase the data, the chip must be exposed to ultraviolet light. This means of erasure is not exactly practical outside of a factory environment, and reprogramming the chip is not possible without special equipment. Until now, users had to physically replace EPROMs in their system with new ones that were programmed at the factory.

A “Flash” EPROM differs from a standard EPROM because it can be erased by simply applying a voltage to it. It can also be reprogrammed with software you can run on your system. This allows you to upgrade the information in the BIOS simply by running a program.

An EPROM is generally used in computers to store system configuration and BIOS information. If it becomes necessary to update your BIOS information, ALR will send you the software and instructions necessary to do so.



**CAUTION:** Please be sure to read the README file before attempting a BIOS upgrade. Failure to follow all instructions can make your system’s BIOS chip unusable. BIOS chips rendered unusable by improper upgrading procedures are not covered by your warranty and are subject to a replacement fee. Also, your system will be unusable until you receive and install a new BIOS chip.

# Chapter 4

## Standard System Configuration

This chapter describes the configurations for the various components of the standard Flyer 32LCT system. The following boards and controllers are included with the standard Flyer 32LCT system:

- system board
- ALR CPU module
- VGA controller (embedded)
- IDE hard disk controller (embedded)
- floppy disk controller (embedded)



**NOTE:** The Flyer 32LCT hardware configurations are factory set and should normally require no changes. Descriptions provided in this chapter are intended as reference aids.



---

## Installing Foot on Flyer 32LCT

---

1. Place the system unit on top of foot, aligning tabs to key hole in chassis.
2. Slide the foot forward until it engages the snap lock.

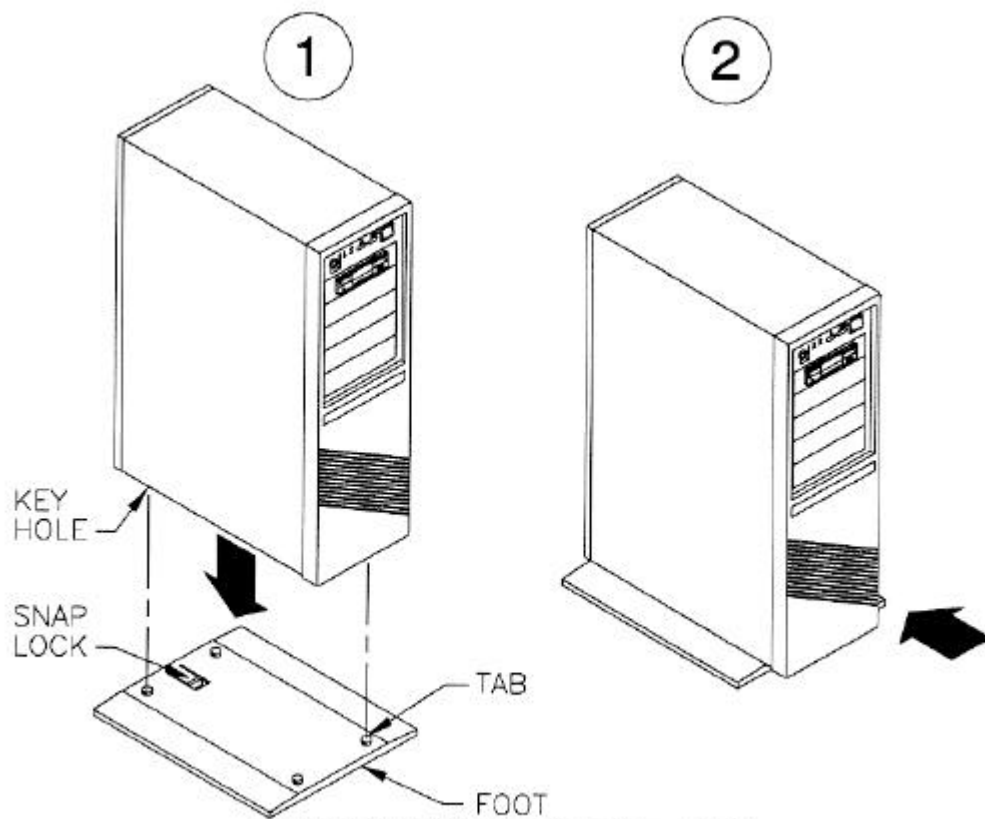


Figure 4-1: Installing Foot on Flyer 32LCT

---

## Opening the System Unit

---



**CAUTION:** Make sure the power switch is OFF and the power cord is removed from the system unit. Turn off any other equipment connected to the computer. Installing any component while the power is ON can permanently damage your computer and its parts.

To open the chassis to re-configure the boards and/or add optional accessories, refer to Figure 4-2 and follow the procedure below.

1. Remove the six screws on the back of the chassis. Unlock the keylock located on the rear of your system and then slide the chassis cover backwards about an inch and lift straight up.
2. If you are installing a device in the front-facing storage bays you will also need to remove the front bezel from the chassis. Remove the six screws that attach the front bezel to the chassis. Gently swing the bezel towards the right, enough to clear the opening. (The wires should be long enough such that you won't have to unplug and reconnect them.) It is not necessary to remove the bezel when changing internal components.

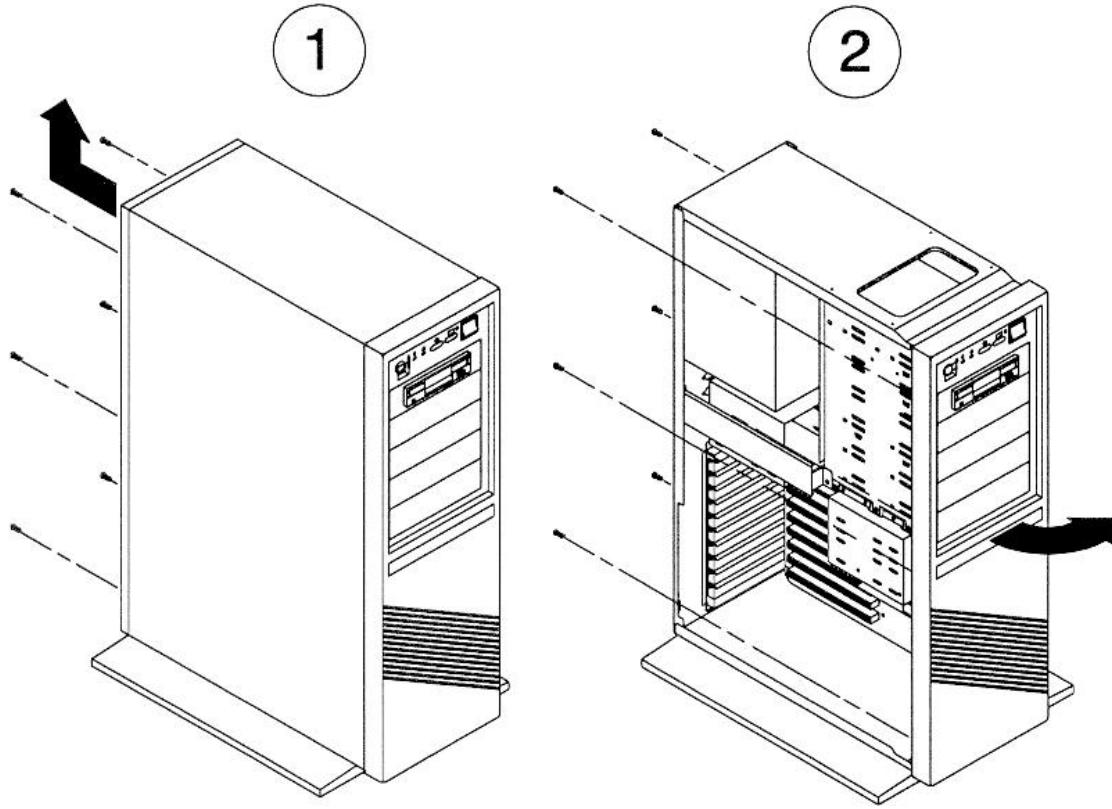


Figure 4-2: Opening the System Unit

---

## System Board Layout

---

Figure 4-3 shows the locations of the various system board components. The following sections describe how to configure these components and I/O ports.

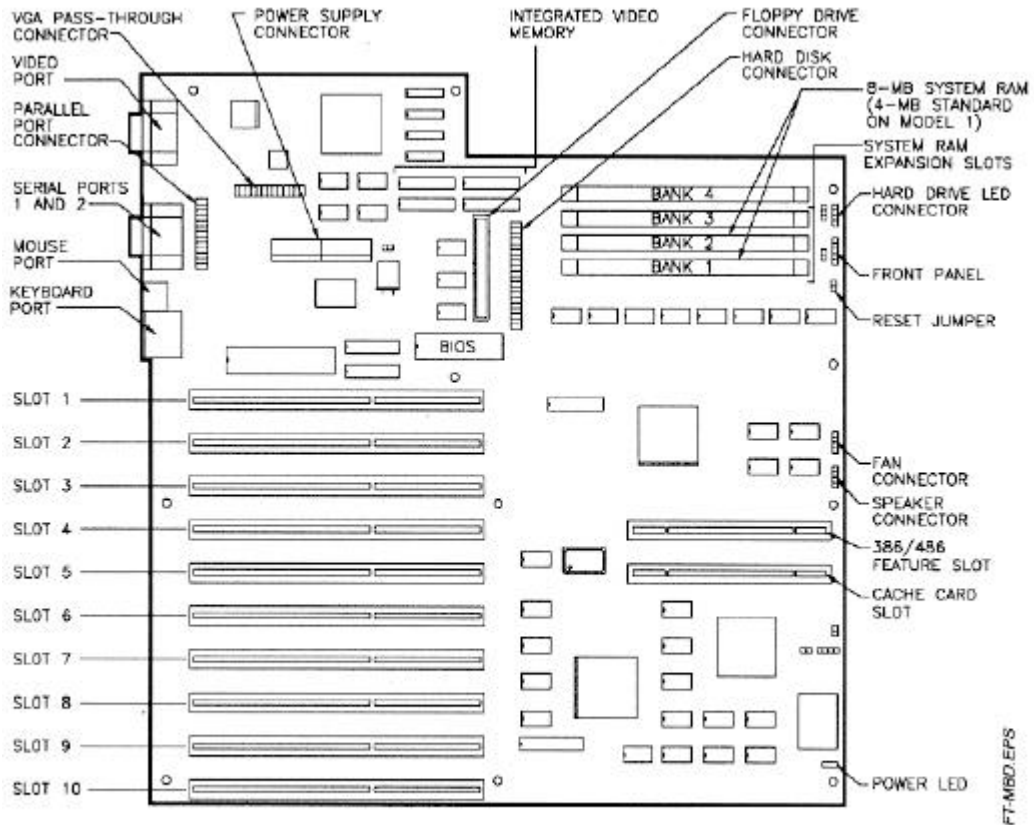


Figure 4-3: Flyer 32LCT System Board

### Memory

The standard Flyer 32LCT contains 4-MB (8-MB on models with hard drives) of memory with a maximum on board expansion to 64-MB using 4-MB x 36 Single Inline Memory Modules (SIMMs).

Run the appropriate BIOS SETUP to reconfigure the system if you add memory to your Flyer 32LCT.

**Floppy Disk Controller Configuration**

The system board includes an integrated floppy disk controller which contains the circuitry and control functions for interfacing up to two floppy disk drives. This controller supports 3.5-inch drives with 720-KB or 1.44-MB capacities and 5.25-inch drives with 360-KB or 1.2-MB capacities.

The AIR MULTUS IDE controller is also available as an option. The MULTUS allows you to connect up to four IDE hard drives for increased system performance.

Run the appropriate BIOS SETUP to reconfigure the system if you install additional floppy disk drives.

**Hard Disk Controller Configuration**

The Flyer 32LCT system board also includes an integrated IDE hard disk controller which contains the circuitry and control functions for interfacing up to two IDE hard disk drives.

An IDE caching controller is available as an option that allows the Flyer 32LCT to support two additional hard drives. The AIR MULTUS IDE controller offers even more advanced features, linking up to four IDE hard drives together. Refer to the Options booklet for further information.

Run the appropriate BIOS SETUP to reconfigure the system if you install additional hard disk drives.

**16-Bit ISA Slot Configuration**

Eight slots support full-sized 16-bit ISA cards and two slots support half-length cards for such devices as network cards, modems, controller cards, scanners, FAX modems and CD-ROMs.

---

**ALR CPU Module**

---

With the Flyer 32LCT, several sophisticated 486SX or 486 CPU modules are available as standard equipment. These modules either contain a socket for coprocessor support or have a coprocessor built-in. CPU modules can be removed and upgraded as the need arises. However, do not remove the CPU module unless you are upgrading your system or installing a coprocessor. (Refer to the Options booklet, included in your documentation package, for instructions.)

---

## System Board Memory Configuration

---

The standard Flyer 32LCT systems include 4-MB (8-MB on hard drive models) of memory installed on the system board. Figure 4-3 (see “System Board Layout” in this chapter) shows the Flyer 32LCT system board and location of Banks 1, 2, 3 and 4.

Table 4-1 lists possible system board memory configurations for the Flyer 32LCT. The maximum system board memory is 64-MB.

Instructions for installing additional memory is discussed in the Options booklet, included in your documentation package.

Table 4-1: Flyer 32LCT Memory Configurations

Bank 1	Bank 2	Bank 3	Bank 4	Total Memory (MB)
1-MB Kit	—	—	—	1-MB
1-MB Kit	1-MB Kit	—	—	2-MB
1-MB Kit	1-MB Kit	1-MB Kit	—	3-MB
1-MB Kit	1-MB Kit	1-MB Kit	1-MB Kit	4-MB
4-MB Kit	—	—	—	4-MB
1-MB Kit	4-MB Kit	—	—	5-MB
1-MB Kit	1-MB Kit	4-MB Kit	—	6-MB
4-MB Kit	4-MB Kit	—	—	8-MB
1-MB Kit	4-MB Kit	4-MB Kit	—	9-MB
1-MB Kit	1-MB Kit	4-MB Kit	4-MB Kit	10-MB
4-MB Kit	4-MB Kit	4-MB Kit	—	12-MB
4-MB Kit	4-MB Kit	4-MB Kit	4-MB Kit	16-MB
16-MB Kit	—	—	—	16-MB
4-MB Kit	16-MB Kit	—	—	20-MB
4-MB Kit	4-MB Kit	16-MB Kit	—	24-MB
16-MB Kit	16-MB Kit	—	—	32-MB
4-MB Kit	16-MB Kit	16-MB Kit	—	36-MB
4-MB Kit	4-MB Kit	16-MB Kit	16-MB Kit	40-MB
16-MB Kit	16-MB Kit	16-MB Kit	—	48-MB
16-MB Kit	16-MB Kit	16-MB Kit	16-MB Kit	64-MB

The contents of each kit are listed below:

1-MB Kit contains one 256-KB x 36 SIMM

4-MB Kit contains one 1-MB x 36 SIMM

16-MB Kit contains one 4-MB x 36 SIMM

---

## **VGA Controller**

---

An embedded VGA controller comes standard with the Flyer 32LCT and is 100% VGA compatible. This graphics adapter has 512-KB of video memory and can support 1024 x 768, 16 colors.

Various applications drivers are included in the video drivers diskettes contained in your documentation package. Please read the README files for instructions.

# Appendix A

## Error Messages

The power-on self test displays messages when it detects nonfatal on board or off board failures. There are two types of error messages:

- Nonfatal Errors display information on your monitor.
- Fatal System Board Error Beep Codes signal an error condition when a message cannot be displayed on your monitor.



**NOTE:** For recurring problems, do the following:

- Call your nearest authorized AIR dealer.
- Call the ALR Technical Support at (714) 458-0863.

Remember, DO NOT send any equipment without a Return Material Authorization (RMA) and original packaging. The RMA number must be written clearly on the carton in which the equipment is shipped.



---

## Nonfatal Errors

---

This section lists messages and their explanation and possible solutions that may be displayed when your computer boots up. Variable [xxx] items differ from message to message.

### **[xxx] Base Memory, [xxx] Expansion**

**Explanation:**  
This message is for your information only.

*Solution:*  
*No action necessary.*

---

### **Checksum error on extended CMOS RAM.**

**Explanation:**  
Data in the extended CMOS RAM is not valid.

*Solution:*  
*Run the SETUP program as described in Chapter 2 of this manual.*

---

### **Decreasing available memory**

**Explanation:**  
Your system's RAM chips may be defective or the SIMMs may be improperly installed.

*Solution:*  
*Check the SIMMs, make sure they are ALR SIMMs, and then check if they're properly inserted into their sockets. Replace if necessary.*

---

### **Diskette drive 0 seek to track 0 failed**

**Explanation:**  
Your system's configuration is incorrect; the actual floppy drive in your system is different from that specified in your SETUP configuration. This error message may also result if you have a drive failure, or if the floppy drive cable is not properly inserted.

*Solution:*

*Check your SETUP configuration and make sure the correct drive is selected. Make sure the floppy drive cable is properly installed and secured.*

---

**Diskette drive reset failed**

## Explanation:

Your system's configuration is incorrect. The actual floppy drive in your system does not match the one specified in your SETUP configuration or the floppy drive/cables may be defective.

*Solution:*

*Check your SETUP configuration and make sure the correct drive is selected. Replace the drive/cable.*

---

**Diskette read failed - strike F1 to retry boot**

## Explanation:

The floppy disk inserted in your drive is not a bootable disk or the configuration for your drive is incorrect.

*Solution:*

*Make sure that your boot disk contains a file called COMMAND.COM. Use the configuration utility to check your drive configuration. Press F1 to reboot.*

---

**Gate A20 failure**

## Explanation:

You have an XT keyboard connected to your AT system.

*Solution:*

*Check the switch at the bottom of your key-board and make sure it is pointing to "AT." If the message persists, replace the keyboard.*

---

**Hard disk controller failure**

## Explanation:

The hard disk cable may not be properly secured or may be defective.

*Solution:*  
*Make sure the hard disk cable is properly secured.*

---

### **Hard disk failure**

**Explanation:**  
The hard disk may not have been low-level formatted, the SETUP configuration does not match the type of hard disk actually installed in your system, or the hard disk controller may be defective.

*Solution:*  
*Run the SETUP program, described in Chapter 2 of this manual, and make sure your con-figuration is correct. Contact your authorized ALR dealer for assistance in performing a low-level format.*

---

### **Hard disk failure - strike F1 to retry boot**

**Explanation:**  
The hard disk or hard disk controller may be defective, or the DOS FORMAT has not yet been performed.

*Solution:*  
*Press F1 to reboot. Perform an FDISK and a DOS FORMAT as explained in Chapter 2 of this manual.*

---

### **Invalid configuration information - please run SETUP program**

**Explanation:**  
The information stored in CMOS memory does not match your system's actual configuration during power-up.

*Solution:*  
*Check your system's configuration by running the SETUP program as described in Chapter 2 of this manual.*

---

---

**Keyboard clock line failure****Explanation:**

The keyboard or keyboard chip may be defective.

**Solution:**

*Try another keyboard or check that the keyboard is in “AT” mode. Or, replace the keyboard chip.*

---

**Keyboard controller failure****Explanation:**

The keyboard or keyboard chip may be defective.

**Solution:**

*Try another keyboard or check that the keyboard is in “AT” mode. Or, replace the keyboard chip.*

---

**Keyboard data line failure****Explanation:**

The keyboard or keyboard chip may be defective.

**Solution:**

*Try another keyboard or check that the keyboard is in “AT” mode. Or, replace the keyboard chip.*

---

**Keyboard stuck key failure****Explanation:**

One of the keyboard keys may be jammed.

**Solution:**

*Push the jammed key to release it or replace the keyboard.*

---

**Memory address line failure at [xxx], read [xxx] expecting [xxx]****Explanation:**

Your system’s RAM chips may be defective or the SIMMs may be improperly installed.

*Solution:*

*Check the SIMMs, make sure they are ALR SIMMs, and then check if they're properly inserted into their sockets. Replace if necessary.*

---

**Memory high address line failure at [xxx], read [xxx] expecting [xxx]**

## Explanation:

Your system's RAM chips may be defective or the SIMMs may be improperly installed. Also, the SIMMs must have 80-ns DRAM speed.

*Solution:*

*Check if the SIMMs are properly inserted into their sockets. Replace if necessary.*

---

**Memory parity failure at [xxx-xxx]**

## Explanation:

The parity RAM chips may be defective or the SIMMs may be improperly installed. Also, the SIMMs must have 80-ns DRAM speed. Additional memory size does not match total memory installed.

*Solution:*

*Make sure the SIMM chips are properly installed into their sockets. Replace if necessary.*

---

**Memory test terminated by keystroke**

## Explanation:

During power-up, the space bar was pressed while the system was running the memory test.

*Solution:*

*No action necessary.*

---

**Memory write/read failure at [xxx], read [xxx] expecting [xxx]**

## Explanation:

Your system's RAM chips may be defective or the SIMMs may be improperly installed. Also, the speed jumpers may be improperly set.

*Solution:*

*Check the SIMMs and make sure they're properly inserted into their sockets. Replace if necessary. Verify the DRAM speed is 80-ns.*

---

**No boot device available - strike F1 to retry boot**

## Explanation:

There's no bootable file on the floppy disk, the diskette or the floppy disk controller may be defective.

*Solution:*

*Make sure the boot disk contains the COMMAND.COM file. Check that the floppy disk is set properly in the BIOS SETUP program. Press F1 to reboot.*

---

**No boot sector on hard disk - strike F1 to retry boot**

## Explanation:

There's no bootable file on the hard disk. The hard disk has either been damaged or has never been formatted.

*Solution:*

*Press F1 to reboot. If the message persists, format the hard disk as follows:*

*FORMAT C:/S <Enter>*

---

**Not a boot diskette - press F1 to retry boot**

## Explanation:

There's no bootable file on the boot disk or your system's SETUP configuration does not match the actual floppy drive on the system.

*Solution:*

*Make sure the boot disk contains the COMMAND.COM file. Press F1 to reboot. Run the SETUP program, described in Chapter 2 of this manual, to configure the correct floppy drive.*

---

**No timer tick****Explanation:**

Your system's timer circuitry or your system's BIOS chips may be defective or it's an older version.

**Solution:**

*Contact your authorized ALR dealer for assistance.*

---

**[xxx] Optional ROM bad Checksum = [xxx]****Explanation:**

An optional card's BIOS may be defective.

**Solution:**

*Contact your authorized ALR dealer for assistance.*

---

**Phoenix 80x86 ROM BIOS Version x.xx  
Copyright 19xx Phoenix Technologies Ltd.  
All Rights Reserved**

**Explanation:**

This message displays the version of the ROM BIOS installed in your system.

**Solution:**

*No action necessary.*

---

**Shutdown failure****Explanation:**

Your system's hardware circuitry has malfunctioned.

**Solution:**

*Contact your authorized ALR dealer for assistance.*

---

**Strike the F1 key to continue****Explanation:**

The system cannot locate a bootable file from the floppy or hard disk.

**Solution:**

*Insert a bootable DOS diskette into the floppy drive.  
Press F1 to continue the boot.*

---

---

**Time of day clock stopped****Explanation:**

A clock chip may be defective or the battery may be discharged.

**Solution:**

Contact your authorized ALR dealer for assistance in replacing the clock chip.

---

**Timer Chip counter 2 failed****Explanation:**

Your system's hardware circuitry has malfunctioned.

**Solution:**

Contact your authorized ALR dealer for assistance.

---

**Timer of Interrupt Controller Bad****Explanation:**

Your system's hardware circuitry has malfunctioned.

**Solution:**

Contact your authorized ALR dealer for assistance.

---

**Unexpected interrupt in protected mode****Explanation:**

Your system's hardware circuitry has malfunctioned.

**Solution:**

Contact your authorized ALR dealer for assistance.



---

## Fatal System Board Error Beep Codes

---

If an error occurs when the monitor is not available to display the message, the self-test issues a series of beeps to signal the error. The self-test does not issue a beep if a test is aborted while in progress.

For example, a failure of bit 3 in the first 64-KB of RAM causes a 2-1-4 beep code (a burst of two beeps, a single beep, and a burst of four beeps). Additionally, the self-test writes a value to I/O port 80H. This code enables debugging tools to help technical users identify the failed area.

Errors are either fatal (those that halt the system) or nonfatal (those that are not serious enough to halt the system). Fatal errors contain the word “failure.”

Beep Code	Description	680H Code
none	386/i486 register test in progress	01H
1-1-3	Real-time clock write/read failure	02H
1-1-4	ROM BIOS checksum failure	03H
1-2-1	Programmable interval timer failure	04H
1-2-2	DMA initialization failure	05H
1-2-3	DMA page register write/read failure	06H
1-3-1	RAM refresh verification failure	08H
none	1st 64-KB RAM test in progress	09H
1-3-3	1st 64-KB RAM chip or data line multi-bit	0AH
1-3-4	1st 64-KB RAM add/even logic failure	0BH
1-4-1	Address line failure 1st 64-KB RAM	0CH
1-4-2	Parity failure 1st 64-KB RAM	0DH
2-1-1	Bit 0 1st 64-KB RAM failure	10H
2-1-2	Bit 1 1st 64-KB RAM failure	11H
2-1-3	Bit 2 1st 64-KB RAM failure	12H
2-1-4	Bit 3 1st 64-KB RAM failure	13H
2-2-1	Bit 4 1st 64-KB RAM failure	14H
2-2-2	Bit 5 1st 64-KB RAM failure	15H
2-2-3	Bit 6 1st 64-KB RAM failure	16H
2-2-4	Bit 7 1st 64-KB RAM failure	17H
2-3-1	Bit 8 1st 64-KB RAM failure	18H
2-3-2	Bit 9 1st 64-KB RAM failure	19H
2-3-3	Bit A 1st 64-KB RAM failure	1AH
2-3-4	Bit B 1st 64-KB RAM failure	1BH
2-4-1	Bit C 1st 64-KB RAM failure	1CH
2-4-2	Bit D 1st 64-KB RAM failure	1DH
2-4-3	Bit E 1st 64-KB RAM failure	1EH
2-4-4	Bit F 1st 64-KB RAM failure	1FH
3-1-1	Slave DMA register failure	20H

<b>Beep Code</b>	<b>Description</b>	<b>680H Code</b>
3-1-2	Master DMA register failure	21H
3-1-3	Master interrupt mask register failure	22H
3-1-4	Slave interrupt mask register failure	23H
none	Interrupt vector loading in progress	25H
3-2-4	Keyboard controller test failure	27H
none	Real-time clock power failure and checksum calculation in progress	28H
none	Real-time clock configuration validation in progress	29H
none	Search for video ROM in progress	2EH
none	Screen operable	30H
none	Screen running with video ROM	30H
none	Monochrome monitor operable	31H
none	Color monitor (40 column) operable	32H
none	Color monitor (80 column) operable	33H
none	External cache failure	39H
1-1-2	System board select failure	41H
1-1-3	Extended CMOS RAM failure	42H

# Appendix B

## Hard Drive Characteristics

Drive Type	Cylinders	Heads	Precomp	Landing Zone	Sectors	Size (MB)
1	306	4	128	305	17	10
2	615	4	300	615	17	20
3	615	6	300	615	17	30
4	940	8	512	940	17	62
5	1630	15	-1	1630	52	620
6	117	16	0	0	63	57
7	1630	8	-1	1630	52	331
8	329	16	0	0	63	161
9	900	15	-1	901	17	112
10	615	8	128	664	17	40
11	776	8	-1	776	33	100
12	535	10	-1	535	29	75
13	953	7	-1	953	34	110
14	733	7	-1	733	26	65
16	953	5	-1	953	34	79
17	977	5	300,	977	17	40
18	816	15	-1	816	32	191
19	1024	7	512	1023	17	59
20	823	10	-1	823	34	136
21	733	7	300	732	17	42
22	971	5	-1	971	26	61
23	820	6	-1	820	17	40
24	1024	7	-1	1024	34	119
25	1022	7	-1	1022	34	118
26	1024	4	-1	1023	17	34
27	1024	5	-1	1023	17	42
28	1024	8	-1	1023	17	68
29	895	10	0	0	55	240
30	845	7	-1	845	35	101
31	989	5	128	989	17	41
32	1020	15	-1	1024	17	127
33	1024	9	-1	1024	17	76
34	966	9	-1	966	34	144
35	1024	16	-1	1630	63	504

Drive Type	Cylinders	Heads	Precomp	Landing Zone	Sectors	Size (MB)
36	1024	5	512	1024	17	42
37	1024	5	-1	1024	26	65
38	611	16	-1	612	63	300
39	654	16	-1	1630	63	321
40	642	16	-1	1778	63	315
41	917	15	-1	918	17	114
42	1023	15	-1	1024	17	127
43	497	10	-1	497	33	80
44	820	6	-1	820	17	40
45	1024	8	-1	1024	17	68
46	1024	7	-1	1024	26	91
47	288	16	-1	1224	63	141
48	0	0	0	0	0	0
49	0	0	0	0	0	0

- To see this table during the BIOS SETUP, move the cursor to Hard Disk C: and press F1. Drive types and characteristics sometimes change with different BIOS versions, SO it is a good idea to always check the online information.
- Model 120 must be set to Drive Type 24 Model 340 must be set to Drive Type 39 Model 535 must be set to Drive Type 35
- The MULTUS IDE controller requires that drives of any type be set to NOT INSTALLED when the MULTUS is being used in MULTUS mode. When operating the MULTUS in COMPATIBLE mode, enter the normal correct drive type (see chart in this appendix). Hard disk drives supplied with your computer are factory installed; units purchased separately should be supplied with drive type documentation.
- Drive type numbers not assigned are reserved for future use.
- Drive types 48 and 49 are user-definable. That is, you can change the parameters according to your drive specification. See Chapter 2 for details.

# Appendix C

## Standard System Specifications

<i>Architecture</i>	Industry Standard Architecture (ISA)
<i>386/i486 Feature Slot</i>	Proprietary upgrade path to 33-MHz 486DX, 486DX2/66, Intel OverDrive™ Technology CPUs
<i>Cache Card Slot</i>	Proprietary 256-KB cache memory (standard on 4/66d systems only)
<i>ALR CPU Module</i>	486SX/25, 486SX/33, 486DX/33, 486DX2/66
<i>Coprocessor</i>	i487SX Math Coprocessor and Intel Over-Support Drive Processors (486SX/25 and 486SX/33); internal 487-compatible math coprocessor (486DX/33 and 486DX2/66)
<i>On Board</i>	4-MB on Model 1; 8-MB on hard drive Memory models; total system board memory 64-MB
<i>Clock Calendar</i>	CMOS clock calendar
<i>BIOS</i>	Phoenix 128-KB “Flash” EPROM with on board BIOS SETUP program
<i>I/O Ports</i>	Two serial, one each parallel, mouse and keyboard
<i>Expansion Slots</i>	ten 16-bit ISA slots
<i>Storage Bays</i>	Six low-profile devices and six 5.25-inch half-height devices
<i>Hard Disk Drive</i>	High-performance 60-MB (<19-ms), 120-MB (16-ms), 200-MB (<16-ms), 340-MB (<15-ms), or 535-MB (<12-ms) IDE
<i>Hard Disk Controller</i>	Embedded IDE hard disk controller capable of supporting up to two hard drives

<i>Floppy Drives</i>	3.5-inch 1.44-MB (5.25-inch 1.2-MB opt.)	
<i>Floppy Disk Controller</i>	Embedded on the motherboard with support for two floppy drives	
<i>VGA Controller</i>	Embedded 16-bit Super VGA card with 512-KB video memory capable of supporting 1024 x 768	
<i>Keyboard</i>	101-key, enhanced; lockable through button in front panel	
<i>Software</i>	ALR video drivers	
<i>Timer</i>	<i>Channel</i>	<i>Function</i>
	0	Time of Day
	2	Speaker
	3	Watchdog Timer
<i>Interrupts</i>	<i>Interrupt</i>	<i>Function</i>
	0	Timer
	1	Keyboard
	2	Cascade Interrupt Control
	3	Serial Alternate COM2
	4	Serial Primary COM1
	5	Available
	6	Diskette
	7	Parallel Port LPT1
	8	Real Time Clock
	9	Redirect Cascade
	10	Available
	11	Available
	12	Mouse
	13	Math Coprocessor Exception
	14	Fixed Disk
	15	Available
<i>Power Supply</i>	300 watts	
	<b>NOTE:</b> power consumption for hard drives should not exceed 240 watts	
<i>AC Input</i>	120 VAC or 240 VAC	
<i>DC Output</i>	35A @ +5V, 0.3A @ -5V, 10A @ +12V 0.3A @ -12V	
<i>Temperature</i>	0 to 40 degrees C (operating)	

<i>Humidity</i>	0 to 90% non-condensing (operating)
<i>Altitude</i>	8,000 feet (max.)
<i>Dimensions</i>	24.25" H x 7.5" W x 15.25" D Weight 55 lbs.