1504

Light-Duty Industrial
Node PC

User Manual

Printed in the United States of America

Revision	*Description*	*Date*
A	Manual Released	7/04

Part Number 143580(A)

Trademark Information
Brand or product names are trademarks or registered trademarks of their respective owners. Intel and Pentium are registered trademarks and Celeron is a trademark of Intel Corporation. Windows, Windows NT, and Windows XP are registered trademarks of Microsoft Corporation in the U.S. and in other countries.

Copyright Information
This document is copyrighted by Xycom Automation Incorporated (Xycom Automation) and shall not be reproduced or copied without expressed written authorization from Xycom Automation.

The information contained within this document is subject to change without notice. Xycom Automation does not guarantee the accuracy of the information.

United States FCC Part 15, Subpart B, Class A EMI Compliance Statement:
NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at the user's expense.

For European Users – WARNING:
This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

INSTALLATION: Electromagnetic Compatibility WARNING:
The connection of non-shielded equipment interface cables to this equipment will invalidate FCC EMI and European Union EMC compliance and may result in electromagnetic interference and/or susceptibility levels which are in violation of regulations applying to the legal operation of this device. It is the responsibility of the system integrator and/or user to apply the following directions relating to installation and configuration:

All interface cables must include shielded cables. Braid/foil type shields are recommended. Communication cable connectors must be metal, ideally zinc die-cast backshell types, and provide 360-degree protection about the interface wires. The cable shield braid must be terminated directly to the metal connector shell; ground drain wires alone are not adequate.

Protective measures for power and interface cables as described within this manual must be applied. Do not leave cables connected to unused interfaces or disconnected at one end. Changes or modifications to this device not expressly approved by the manufacturer could void the user's authority to operate the equipment.

EMC compliance is, in part, a function of PCB design. Third party add-on peripheral PCB assemblies installed within this apparatus may void EMC compliance. FCC/CE compliant PCB assemblies should always be used where possible. XYCOM AUTOMATION can accept no responsibility for the EMC performance of this apparatus after system integrator/user installation of PCB assemblies not manufactured and/or expressly tested and approved for compliance by XYCOM AUTOMATION. It is the responsibility of the system integrator/user to ensure that installation and operation of such devices does not void EMC compliance.

Table of Contents

Chapter 1 Introduction

Product Overview

The 1504 Light-Duty Node Box PC Computer System offers a powerful, compact package for the factory floor and other harsh environments. The 1504 features an open architecture to meet a wide variety of applications that require both a powerful PC and a durable industrial enclosure. The system integrates a 40 GB hard drive, 6-slot backplane, and CD-ROM in a truly industrial form.

The system's highly expandable design allows easy access to expansion boards, jumpers, power supply, and disk drives.

Standard Features

The 1504 offers the following standard features:

- Panel or shelf mountable, horizontally or vertically

- SBC-375 single board computer with Intel® Socket 370 Intel Celeron 1.2 GHz CPU, 256 KB cache, 100 MHz system bus, or optional Pentium III 1.26 GHz processors, 512 KB cache, 133 MHz System Bus

- 6-slot passive backplane with the following available expansion:
  - Two full-length ISA
  - Three full-length PCI
  - One half-length PCI length

- Status LEDs
  - Power
  - Hard Disk/CD-ROM activity

- External connection ports
  - Two serial ports (two RS-232 high-speed 16C550-compatible)
  - One parallel port
  - PS/2 keyboard and mouse ports (use of both via Y-cable)
  - VGA port
  - Audio (Out)
  - Two USB 1.1 ports

- Built-in 10/100 Base T Ethernet port

- Integrated AGP graphics controller with 32MB or 64MB, with DVMT

- Front accessible CD-ROM drive (with CD-R/W, DVD or DVD-R/W upgrade options)

- Front accessible 3.5-inch (1.44 MB) internal floppy drive

- 40 GB internal hard drive (minimum)

- Integrated PCI IDE

- Power switch (refer to warning in Quick Startup section of this chapter)

- Award 4MB Flash BIOS

Optional Features

168-Pin DIMM

The memory capacity is up to 512 MB (2XDIMM)

- 256 MB PC133 SDRAM

- 512 MB PC133 SDRAM

Operating Systems

The 1504 comes preloaded with Windows® 2000, and an option to load Windows® XP Professional, or have no operating system loaded.

System Components

This section describes the components on the 1504 unit to help you locate features relevant to installation.

Table 1-1. 1504 System Components

Feature	Description
Hard Drive	The 1504 has a 40 GB (minimum) hard drive.
CD-ROM Drive	The 1504 has a CD-ROM drive, with optional with CD-R/W, DVD or DVD-R/W upgrades available.
Floppy Drive	The 1504 has a 3.5-inch internal floppy drive.
I/O Ports	The 1504 has 2 serial, 1 parallel, two USB 1.1, and VGA ports.
KBD/Mouse Port	The 1504 has a KBD/Mouse Port on the rear of the unit.
Ethernet Port	The 1504 has a Ethernet port that provides a 10/100BASE-T connection.
Status LEDs	Power Lit when there is power to the 1504. HDD Lit when the computer module is accessing the CD-ROM or hard drive. During power-up, firmware on the processor board checks the hardware configuration against the configuration stored in the CMOS memory.
Expansion Slots	The 1504 has a 6-slot passive backplane with one full-length ISA, one full-length PCI, and one half-length PCI available for expansion.
Reset button	Resets the 1504 system.
Fan and Filter	The 1504 has a fan and filter. The filter can be removed for cleaning (refer to the *Fan Filter Cleaning* section in Chapter 4 for more details).
Power Supply	The 1504 has a power supply of 150W AC, auto-ranging, 50/60 Hz, 100-132V AC/200-240V AC, 4.0 A maximum. There is an internal power supply fan.

Internal View
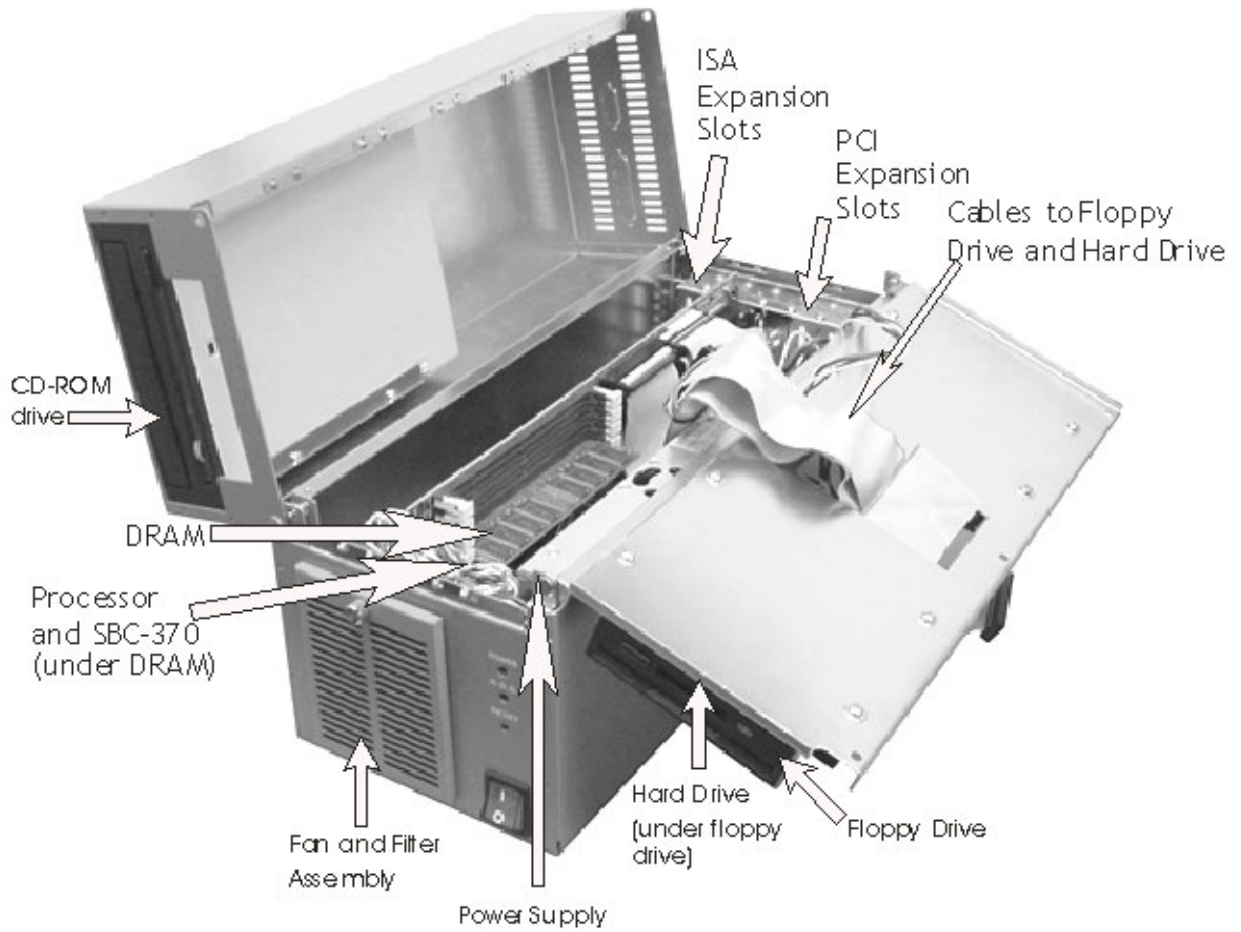
Figure 1-1. 1504 View from Front, with Top Open

Front View
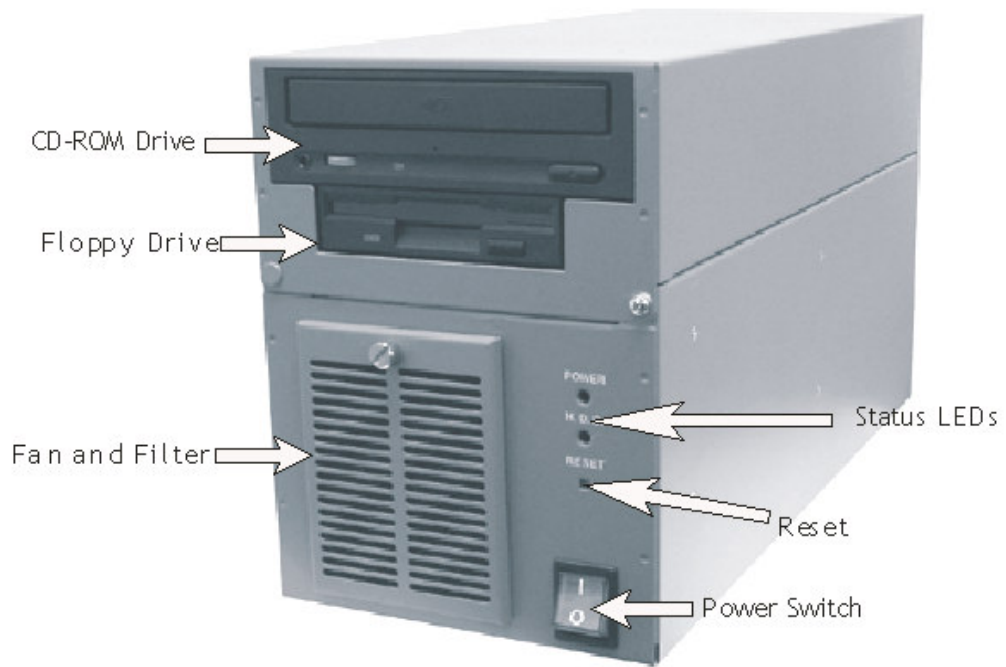
Figure 1-2. 1504 Front View (angled)

Back View
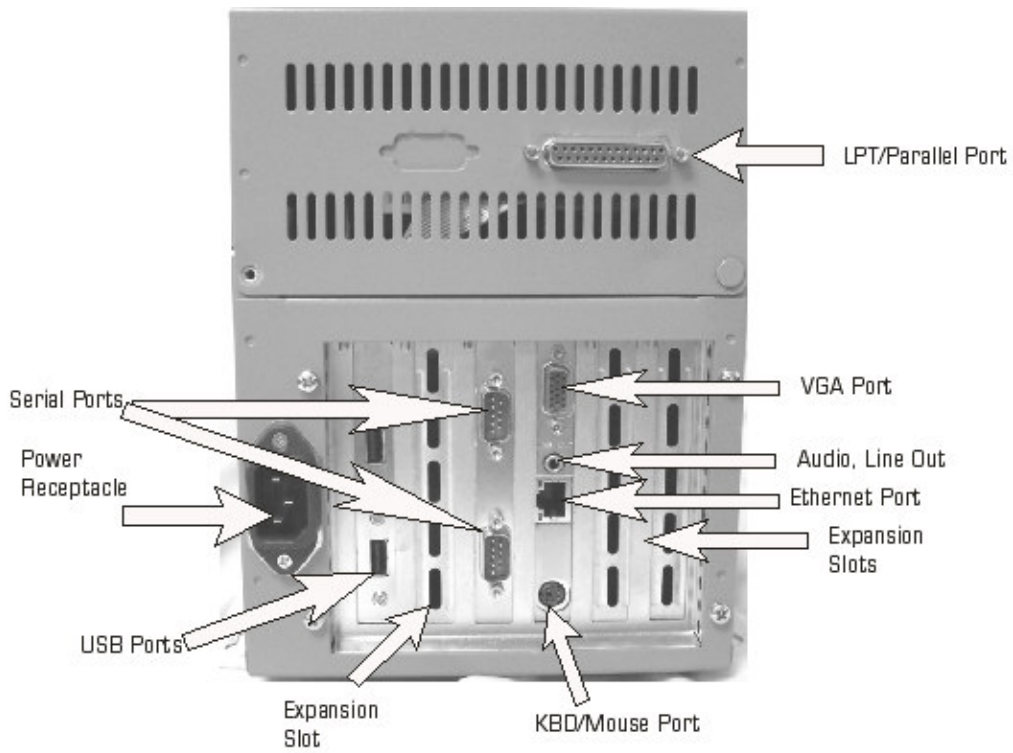
Figure 1-3. 1504 Back View

Unpacking the System

When you remove the 1504 from its box, verify that you have the parts listed below. Xycom Automation recommends that you save the box and inner wrapping in the event you need to reship the unit.

- 1504 unit
- Documentation kit, which includes:
  - Documentation Support Library CD (documentation and drivers)
    - 1504 manual
    - Drivers
  - Xycom Automation Recovery Media and documentation for Windows® 2000
  - Installation disk for Windows® XP (if applicable)
- AC power cord
- Mounting hardware:
  - Four 10-32 x 5/8 screws
  - Mounting brackets for vertical or horizontal mounting
- Miscellaneous:
  - Screws (six FH M3 x 6 screws to attach brackets)
  - Cables
  - Ties
  - Feet for vertical or horizontal shelf mounting

Quick Start-up

This section gives you the steps to get the 1504 up and running without explaining the capabilities and options of the system.

Warning

Turn off the power to the unit and disconnect the power cord before modifying the inside or the outside of the computer.

To prepare the system for use, perform the following steps:

1. Attach a keyboard to the keyboard port.

2. Attach a monitor to the VGA connector.

3. Attach the power cord from the power receptacle to a properly grounded 115/230 VAC, 50-60 Hz outlet.

4. Turn on the power to the unit.

5. The system will boot up to the C:\ prompt.

6. Install application software that you will use onto your system via the CD-ROM drive or network connection.

Chapter 2 Installation

This chapter offers detailed installation instructions and outlines the options for the 1504 Light-Duty PC. It also includes the guidelines for preparing your 1504 unit for installation and use.

Installation Overview

Read the following sections carefully to be sure that you are complying with all the safety requirements.

1. Locate an appropriate position for your 1504 that meets the specifications required and allows easy access to the 1504 ports.

   - Be sure to account for the unit's height and width when choosing the enclosure

2. Decide if you will be mounting the unit or just placing it on a shelf or in a panel.

3. If you do not plan to mount the unit, attach the feet and place the unit as desired. Skip to Step 8.

   - Be sure to place the unit at a comfortable working level

4. If you plan to mount the unit, refer to the section for dimensions for the vertical mounting of your 1504 unit.

   - Be sure to place the unit at a comfortable working level

5. Once the mounting brackets are attached, mount and properly secure the 1504 unit to the panel or shelf.

6. Attach one end of the power cord to the power receptacle and the other end to a properly grounded 100/132 OR 200-240V AC outlet.

7. Turn on the power. The system will boot up to the operating system installed.

8. Install application software via a floppy drive or CD-ROM.

Additional aspects to take into account when mounting your 1504 unit:

- Consider locations of accessories such as AC power outlets for installation and maintenance convenience.
- Prevent condensation by installing a thermostat-controlled heater or air conditioner.
- To allow for maximum cooling, avoid obstructing the airflow.
- Place any fans or blowers close to the heat generating devices. If using a fan, ensure that outside air is not brought inside the enclosure unless a fabric or other reliable filter is used. This filtration prevents conductive particles or other harmful contaminants from entering the enclosure.
- Do not select a location near equipment that generates excessive electromagnetic interference (EMI) or radio frequency interface (RFI) (equipment such as high power welding machines, induction heating equipment and large motor starters).
- Place incoming power line devices (such as isolation or constant voltage transformers, local power disconnects, and surge suppressers) away from the 1504. The proper location of incoming line devices keeps power wire runs as short as possible and minimizes electrical noise transmitted to the 1504.
- The power cord outlet must be installed near the equipment and shall be easily accessible.
- Avoid overloading the supply circuit.
- Incorporate a readily accessible disconnect device in the fixed wiring for permanently connected systems.
- Make sure the location does not exceed the 1504's shock, vibration, and temperature specifications.

Mounting Dimensions and Mounting Brackets

If you decide to mount the 1504 unit, use the diagrams below to prepare the shelf or panel. Figure 2-1 shows how the unit will look when mounted.
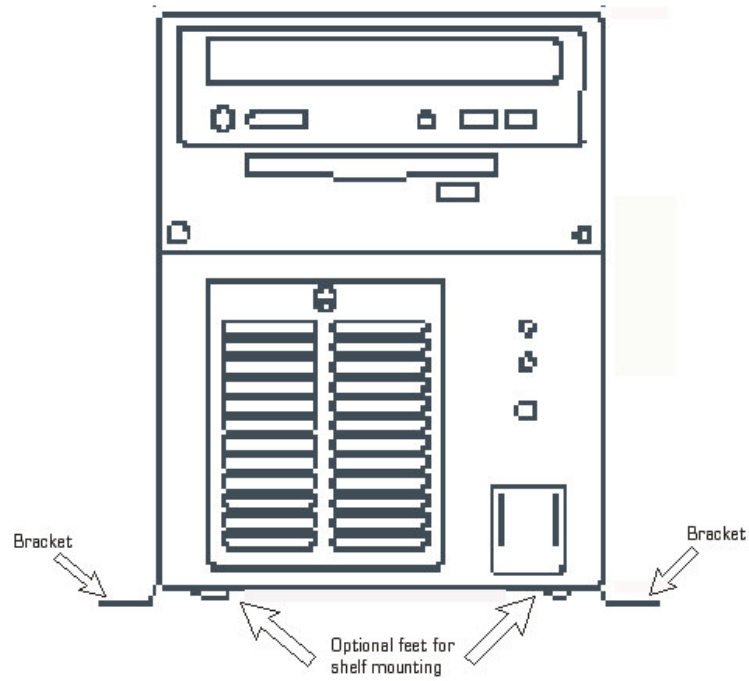
Figure 2-1. 1504 unit, mounted vertically

Front of unit

Ø 0.39
(Ø 10.0)

7.34
(186.5)

1.56
(39.7)

0.94
(24.0)

R 0.098
(R 2.5)

9.92
(252.0)

0.51
(12.9)

0.94
(24.0)

Back of unit
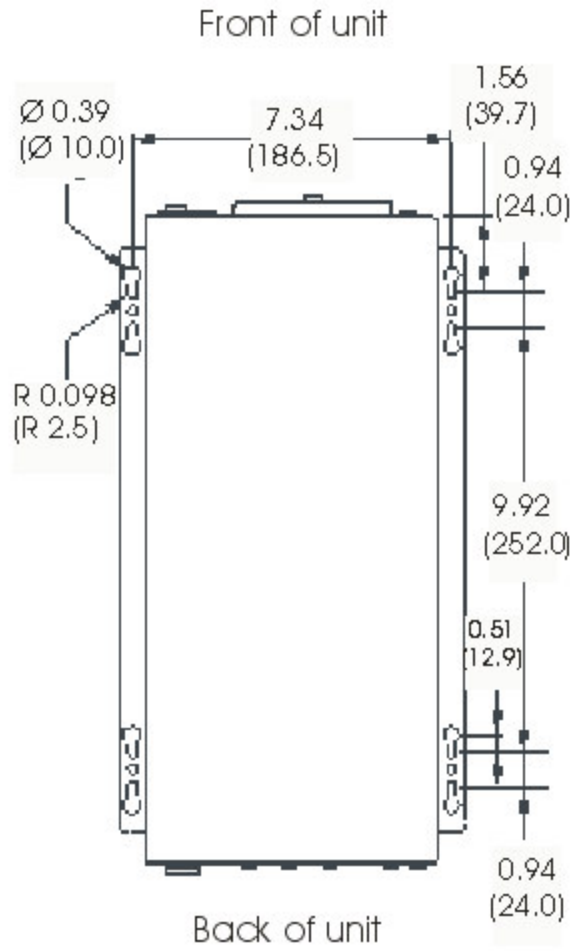
Figure 2-2. Dimensions for Attaching Mounting Brackets
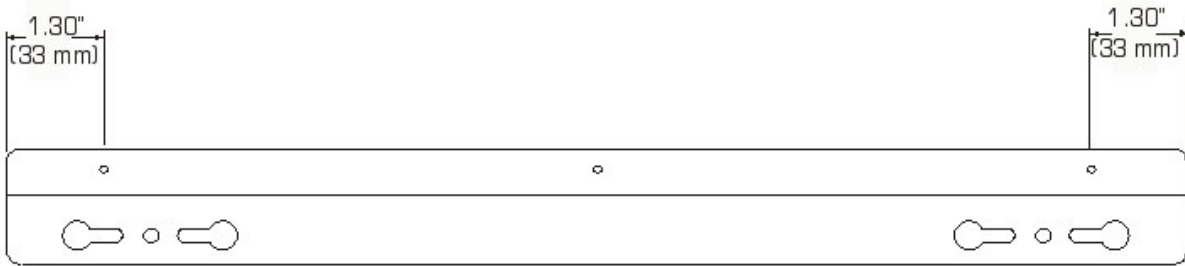
Figure 2-3. Mounting Bracket

Securing the Mounting Brackets

After determining the mounting orientation for your 1504 unit, follow these steps to secure the mounting brackets. Refer to Figure 2-3 for the mounting bracket dimensions. Refer to Figure 2-2 for mounting dimensions and views to mount the 1504.

To mount the unit, the brackets should be mounted on the long sides of the bottom of the unit (see Figure 2-1).

1. Place the unit top down on a flat, protected surface.

2. Using three of the six FH M3 x 6 screws provided in the kit shipped with your 1504, secure one of the brackets to the bottom of the unit.

3. Using the other three screws, secure the other bracket to the unit.

4. Mount the 1504, using the mounting brackets that you secured to the 1504 unit, to the shelf or panel where the unit will reside.

Power Management

The following paragraphs explain the system power, the power supply, and the effects of excessive heat, electrical noise, and line voltage variation of the 1504 unit.

System Power

It is always a good idea to use isolation transformers on the incoming AC power line to the 1504. An isolation transformer is especially desirable in cases where heavy equipment is likely to introduce noise onto the AC line. The isolation transformer can also serve as a step-down transformer to reduce the incoming line voltage to a desired level. The transformer should have a sufficient power rating (units of volt-amperes) to supply the load adequately.

Proper grounding is essential to all safe electrical installations. Refer to the relevant Federal, State, Provincial, and local electric codes that provide data such as the size and types of conductors, color codes and connections necessary for safe grounding of electrical components. The code specifies that a grounding path must be permanent (no solder), continuous, and able to safely conduct the ground-fault current in the system with minimal impedance (minimum wire required is 18 AWG, 1 mm).

Observe the following practices:

- Separate ground wires (P.E. or Protective Earth) from power wires at the point of entry to the enclosure. To minimize the ground wire length within the enclosure, locate the ground reference point near the point of entry for the plant power supply.

- All electrical racks or chassis and machine elements should be Earth Grounded in installations where high levels of electrical noise are expected. Ground the chassis with a ground rod or attach to a nearby Earth structure such as a steel support beam. Each different apparatus should be connected to a single Earth Ground point in a "star" configuration with low impedance cable. Scrape away paint and other nonconductive material from the area where a chassis makes contact with the enclosure. In addition to the ground connection made through the mounting bolt or stud, use a one-inch metal braid or size #8 AWG wire to connect between each chassis and the enclosure at the mounting bolt or stud.

Excessive Heat

The 1504 withstands operating temperatures from 0° to 50° C (32° to 122° F). To keep the temperature in range, the cooling air at the base of the system must not exceed 50°C. Allocate proper spacing between internal components installed in the enclosure.

When the air temperature is higher than 50ºC in the enclosure use a fan or air conditioner.

Electrical Noise

Electrical noise is seldom responsible for damaging components, unless extremely high energy or high voltage levels are present. However, noise can cause temporary malfunctions that can result in hazardous machine operation in certain applications. Noise may be present only at certain times, may appear at widely spread intervals, or in some cases may exist continuously.

Noise commonly enters through input, output, and power supply lines and may also be coupled through the capacitance between these lines and noise signal carrier lines. This usually results from the presence of high voltage or long, close-spaced conductors. When control lines are closely spaced with lines carrying large currents, the coupling of magnetic fields can also occur. Use shielded cables to help minimize noise. Potential noise generators include switching components relays, solenoids, motors, and motor starters.

Refer to the relevant Federal, State, Provincial, and local electric codes that provide data such as the size and types of conductors, color codes and connections necessary for safe grounding of electrical components. It is recommended that the high voltage and low voltage cabling be separated and dressed apart. In particular, the AC cables and switch wiring should not be in the same conduit with all communication cables.

Line Voltage Variation

The unit's power supply is built to operate with output voltage ranges of 100-132 / 200-240 VAC with an AC power supply, and still allow the system to function within its operating margin. As long as the incoming voltage is adequate, the power supply provides all the logic voltages necessary to support the processor, memory, and I/O.

In cases in which the installation is subject to unusual AC line variations, use a constant voltage transformer to prevent the system from shutting down too often. However, a first step toward the solution of the line variations is to correct any possible feed problem in the distribution system. If this correction does not solve the problem, use a constant voltage transformer.

The constant voltage transformer stabilizes the input voltage to the 1504 by compensating for voltage changes at the primary in order to maintain a steady voltage at the secondary. When using a constant voltage transformer, check that the power rating is sufficient to supply the 1504.

PS/2 Keyboard and Mouse Connector

Both a keyboard and a mouse can be connected to the PS/2-compatible port through the Y adapter cable included with your unit. Connect a mouse into the cable connector that has the mouse icon on it, and a keyboard into the cable connector that has a keyboard icon on it. If connecting only a keyboard, you can connect the keyboard cable directly to the PS/2-compatible connector on the rear of the unit. If connecting only a mouse, the mouse must be connected using the Y adapter cable port. Either the mouse or the keyboard can be used alone and connected using the Y-cable.
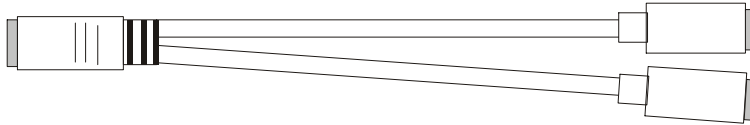
> Y adapter cable for rear keyboard and mouse connector.

Figure 2-4. Y-Cable

Refer to Table C - 6 for the keyboard/mouse connector pin assignments.

Note

Refer to Appendix C Pinouts for pinout information.

Installing Internal Hardware Options

Warning

For qualified service personnel only.

Caution

Turn off the unit before installing internal hardware.

This section describes how to install internal hardware options.

DRAM and Additional DRAM Dual In-Line Memory Modules (DIMMs)

You can order your 1504 unit with two DRAM configurations: 256 MB or 512 MB. To reconfigure the DRAM capacity, change the DRAM DIMMs on your board. You will need to add two 256 MB DIMMs to reach 512 MB.

ISA or PCI Boards

Warning

Total power available for ISA and/or PCI boards is 85W maximum. Total power for +5 V DC and +3.3 V DC combined (summed) must not exceed 45W.

Follow these instructions to install PCI or ISA expansion boards:

1. Turn off power to the unit and unplug the power cord on the rear of the 1504.

2. Check that the board's memory and I/O configuration do not conflict with the CPU and I/O memory maps in your CPU board manual.

3. Unfasten the two screws securing the lid to the unit (see Figure 2-5 for screw placement) and lift the lid.
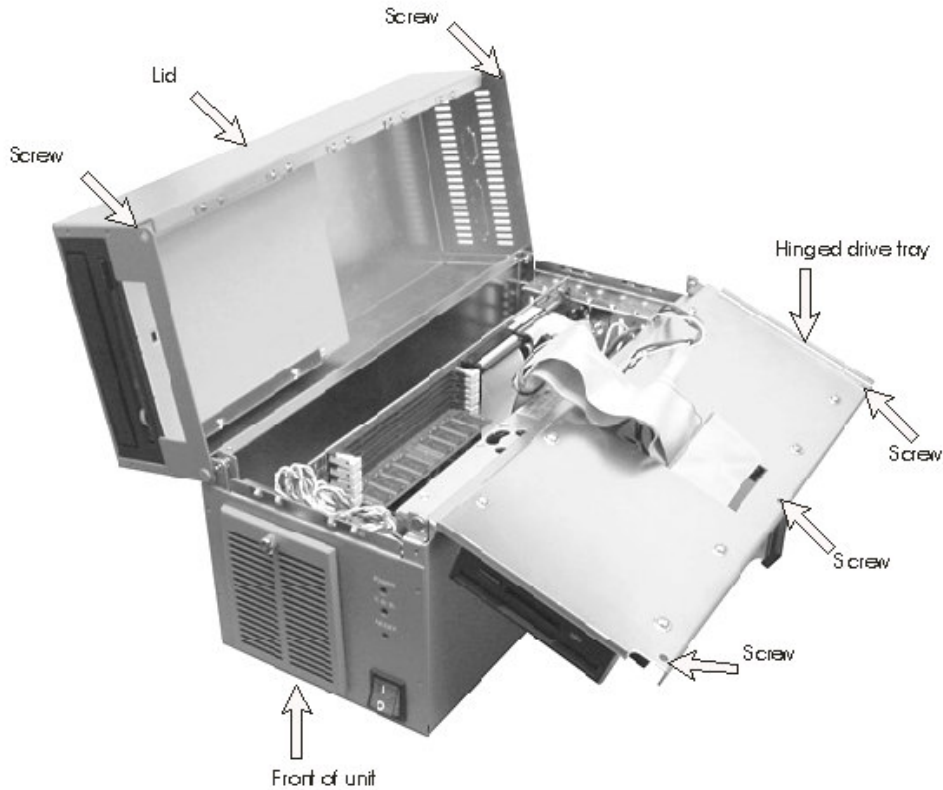
Figure 2-5. Open unit, showing screw placement.

4. Disconnect the CD-ROM cables.

5. Unfasten the three screws securing the hinged drive tray to the unit (see Figure 2-5 for screw placement) and lift the hinged drive tray.

6. Unfasten the screw holding the blank expansion slot cover to the unit, and remove the cover from the desired track.

7. Slide the ISA or PCI expansion board into the desired slot.

8. Push the board into the backplane connectors.

9. Use the clamps included in the kit shipped with your unit to secure the board to the slot.

Note

Do not force the boards or apply uneven pressure.

---

10. Secure the board by installing a screw into the top of the track.

11. Close hinged drive tray and refasten the three screws securing it to the unit (see Figure 2-5 for screw placement).

12. Reconnect the CD-ROM cables.

13. Close lid and refasten the two screws securing it to the unit (see Figure 2-5 for screw placement).

Safety Agency Approval

The Xycom 1504 is UL Listed to meet the following standards:

- *Underwriters Laboratories Standard UL 508, Listed*
  Industrial Control Equipment

- *Canadian Standards Association, Specification C22.2 No. 142, Listed*
  Process Control Equipment

Chapter 3 SBC-375 Motherboard and Award BIOS Setup

This chapter outlines the features of the SBC-375, and explains the Award BIOS setup menus.

SBC-375 Motherboard Features

The following are the features of the SBC-375 motherboard:

- **Processor –**Intel® Socket 370 Intel Celeron 1.2 GHz CPU, 256 KB cache, 100 MHz system bus, or optional Pentium® III 1.26 GHz CPU, 512 KB cache, 133 MHz system bus

- **System Memory -** 168-pin DIMM x 2, Max 512MB/133MHz

- **Chipset -** Intel® 815E

- **USB -** Two USB 1.0 ports

- **BIOS -** Award 4Mb FLASH BIOS

- **Ethernet –** IEEE 802.3u auto-negotiation support for 10/100Base-TX standard, connects through a LAN RJ45 connector

- **IDE Support** - Two PCI-enhanced IDE connectors, supporting Ultra ATA/33/66/100

- **Watchdog timer -** Can generate a system reset. Software selectable time-out interval (1sec.~255sec. 1sec/step; 1min.~254min. 1min/step)

- **VGA Controller –** Embedded VGA controller, which enables screen resolution up to 1600X1200 in 256 colors @ 85Hz refresh

- **Audio -** Onboard AC'97 Codec that supports two channels.

- **Serial Ports –** Two high-speed 16C550 UART compatible ports

- **Parallel Port –** one IEEE1284-compatible bi-directional port

Mechanical Drawing
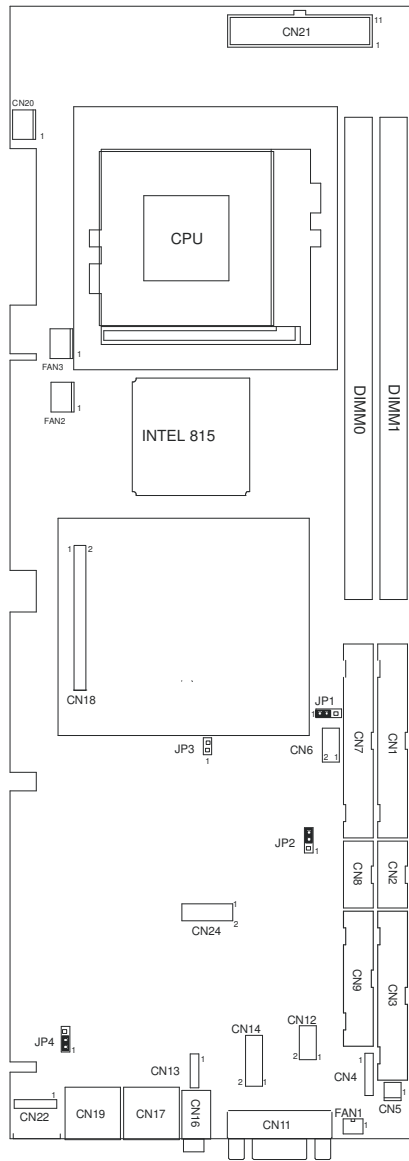
Figure 3-1. SBC-375 Motherboard

Award BIOS CMOS Setup

To change the CMOS settings for the Award BIOS, you must hit <F1> early in the 1504's Power-On Self-Test period. The unit will display a message at the top of the screen during this period. Facsimiles of the various submenus (as each displays on the screen) are shown in the following sections. The menu navigation keystrokes are listed below. The keystrokes allow you to set and/or modify the values of the menu options.

<F1> or <ALT-H> displays General Help Screen. The specific Help messages will be outlined in each specific menu section

<UP> and <DOWN> Arrow keys move between the menu options

<Home> or <End> moves to top or bottom of current menu

To choose an item, enter the letter next to the option description

<Enter> cycles through all options for each item that has options

<L>, in the Main Menu, loads factory installed Setup Default Values

<Q>, in the Main Menu, quits (i.e., exits Setup without saving changes)

<S>, in the Main Menu, saves current settings without exiting Setup

Award's BIOS ROM has a built-in Setup program that allows users to modify the basic system configuration. This type of information is stored in battery-backed CMOS memory so that it retains the Setup information when the power is turned off.

Some items in the BIOS are programmed to auto detect your system. The presence or the values of these items vary with the corresponding hardware specification of your system.

Phoenix – AwardBIOS CMOS Setup Utility	
Standard CMOS Features	Frequency/Voltage Control
Advanced BIOS Features	Load Fail-Safe Defaults
Advanced Chipset Features	Load Optimized Defaults
Integrated Peripherals	Set Supervisor Password
Power Management Setup	Set User Password
PnP/PCI Configurations	Save & Exit Setup
	Exit Without Saving
Esc: Quit ↑↓←→ : Select Item F10: Save & Exit Setup	
Time, Date, Hard Disk Type….	

Figure 3-2. Main Menu – BIOS CMOS Setup

Note that a brief description of each highlighted selection appears at the bottom of the screen.

Table 3-1. BIOS CMOS Setup

Setup Menu	Description
Entering Setup	Power on the computer and press <Del> immediately. This will allow you to enter Setup. The top menu offers users various functions to configure the system. The default page after entering the BIOS setup is [Main - Standard CMOS setup].
Major Setup Features **Main/Standard CMOS Features**	Use this menu for basic system configuration (Date, time, IDE, etc.)
Advanced Features Setup **Advanced BIOS Features** **Advanced Chipset Features** **Integrated Peripherals** **Power Management Setup** **PnP / PCI Configurations**	Use this menu to set the advanced features available on your system: Use this menu to set the advanced features available on your system. Use this menu to change the values of the chipset registers and optimize your system performance. Use this menu to specify your settings for integrated peripherals. (USB, Serial port, Parallel port, keyboard, mouse etc.) Use this menu to specify your settings for power management. (HDD power down, power on by events, KB wake up, etc.) This entry appears if your system supports PnP/PCI.
Default -Load Optimized Defaults **Security -Set/Change Password**	Use this menu to load the BIOS default values that are factory settings for optimal performance system operations. While AWARD has designated the custom BIOS to maximize performance, the factory has the right to change these defaults to meet their needs. Use this menu to set Supervisor/User Passwords.
Clk/Voltage Setup	Use this menu to specify your settings for auto detect DI:MJ\,1/PCI clock and spread spectrum.
PC Health Setup	This menu allows you to set the shutdown temperature for your system.
Save and Exit Setup	Save CMOS value changes to CMOS and exit setup
Exit Without Saving	Abandon all CMOS value changes and exit setup

Standard CMOS Setup

The items in Standard CMOS Setup Menu are divided into 10 categories. Each category includes no, one or more than one setup items. Use the arrow keys to highlight the item and then use the <PgUp> or <PgDn> keys to select the value wanted in each item.

Phoenix – AwardBIOS CMOS Setup Utility	
Standard CMOS Features	

```
        Date:  Mon, Feb 8 2000                      Item Help
        Time:  16:19:20
                                            Menu Level      ➢
  ➢  IDE Primary Master     HD Model Name
  ➢  IDE Primary Slave      <Press Enter>  None   Change the day,  month,
  ➢  IDE Secondary Master   <Press Enter>  None   year and century
  ➢  IDE Secondary Slave    <Press Enter>
     None

     Drive A        1.44M, 3.5 in.
     Drive B              None

     Video      EGA/VGA
     Halt On    All, But Keyboard

     Based Memory                640K
     Extended Memory         129024K
     Total Memory            130048K
```

↑↓←→: Move Enter: Select +/-/PU/PD: Value F10:Save

ESC: Exit F1: General Help F5: Previous Values   F6: Fail-safe defaults   F7:Optimized Defaults

Figure 3-3. Standard CMOS Setup

Table 3-2. Standard CMOS Setup Menu Selections

Menu Field	Description
Date and Time Configuration	The BIOS determines the day of the week from the other date information. This field is *for information only*. Press the left or right arrow key to move to the desired field (date, month, year). Press the PgUp/ - or PgDn/ + key to change the setting, or type the desired value into the field. The time format is based on the 24-hour military-time clock. For example, 1 p.m. is 13:00:00 hours. Press the left or right arrow key to move to the desired field. Press the PgUp / - -or PgDn/ + key to change the setting, or type the desired value into the field.
IDE Primary/Secondary Master/Slave **IDE HDD Auto-Detection**	This section does not show information about other IDE devices, such as a CD-ROM drive, or other hard drive types, such as SCSI drives. **NOTE**: We recommend that you select type AUTO for all drives. The BIOS can automatically detect the specifications and optimal operating mode of almost all IDE hard drives. When you select AUTO for a hard drive, the BIOS will detect its specifications
IDE Primary/Secondary Master/Slave	If you do not want to select "AUTO", other methods of selecting the drive type are available: 1.NONE: No drive type to be selected. 2.Manual: This will allow you to manually set the drive type you are using in your system. (See below)
Drive A & Drive B	Select the correct specifications for the diskette drive(s) installed in the computer: None No diskette drive installed 360K, 5.25 in 5-1/4 inch PC-type standard drive; 360Kbyte capacity 1.2M, 5.25 in 5-1/4 inch AT-type high density drive; 720Kbyte capacity 720K, 3.5 in 3-1/2 inch double sided drive; 360Kbyte capacity 1.44M, 3.5 in 3-1/2 inch double sided drive; 1.44Mbyte capacity 2.88M, 3.5 in 3-1/2 inch double sided drive; 2.88Mbyte capacity
Video	This function setting allows you to select the video type. The choices are: EGA/VGA, CGA 40, CGA 80, and MONO

Halt On	During the Power-On Self-Test (POST), the computer will stop if the BIOS detects a hardware error. You can tell the BIOS to ignore certain errors during POST and continue the boot-up process.
	
	The choices are:
	          All, But Keyboard;
	          All, But Diskette;
	          All, But Disk/Key;
	          All Errors;
	          No Errors.

Base Memory	Typically 640 KB. Also called conventional memory. The DOS operating system and conventional applications use this area.
Extended Memory	Above the I-MB boundary. Early IBM personal computers could not use memory above 1 MB, but current PCs and their software can use extended memory.
Total Memory	The fields show the total installed random access memory (RAM).

IDE Adapters

The IDE adapters control the hard disk drive. Use a separate sub menu to configure each hard disk drive.

Phoenix – AwardBIOS CMOS Setup Utility		
IDE Primary Master		
IDE HDD Auto-Detection	Press Enter	
IDE Primary Master	Auto	Item Help
Access Mode	Auto	Menu Level ➢➢
Capacity	20021 MB	
Cylinder	38792	To auto-detect the HDD's size, head... on this channel
Head	16	
Precomp	0	
Landing Zone	38791	
Sector	63	
↑↓←→Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help F5: Previous Values F6: Fail-safe defaults F7:Optimized Defaults		

Figure 3-4 IDE Primary Master sub menu

Use the legend keys to navigate through this menu and exit to the main menu.

Advanced BIOS Features

This section allows the user to configure the system for basic operation. The user can set and select the system's default speed, boot-up sequence, keyboard operation, shadowing and security.

Phoenix – AwardBIOS CMOS Setup Utility		
Advanced BIOS Features		
Virus Warning Enabled	Disabled	Item Help
CPU Internal Cache	Enabled	Menu Level ➢
External Cache	Enabled	
CPU L2 Cache ECC Checking	Enabled	Allows you to choose
Process Number feature	Enabled	the VIRUS warning
Quick Power On Self Test	Disabled	feature for IDE Hard
LAN (CN17/UP) BootROM	Disabled	Disk boot sector
First Boot device	Floppy	protection. If this
Second Boot device	HDD-0	function is enabled and
Third Boot device	LS120	someone attempt to
Boot other device	Enabled	write data into this
Swap Floppy Drive	Disabled	area, BIOS will show a
Boot Up Floppy Seek	Enabled	warning message on
Boot Up NumLock Status	On	screen and alarm beep
Gate A20 Option	Fast	
Typematic Rate Setting	Disabled	
Typematic Rate (Chars/Sec)	6	
Typematic Delay (Msec)	250	
Security Option	Setup	
OS Select For DRAM > 64MB	Non-OS2	
Report NO FDD For Win 95	No	
↑↓←→Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help F5: Previous Values F6: Fail-safe defaults F7:Optimized Defaults		

Figure 3-5. Advanced BIOS features

Table 3-3. Advanced BIOS Menu Selections

Menu Field	Description
Virus Warning	Allows the user to choose the VIRUS Warning feature for IDE Hard Disk boot sector protection. If this function is enabled and someone attempt to write data into this area, BIOS will show a warning message on screen and launch the alarm beep. Enabled: Activates automatically when the system boots up causing a warning message to appear when anything attempts to access the boot sector or hard disk partition table. Disabled: No warning message will appear when anything attempts to access the boot sector or hard disk partition table.
CPU Internal Cache/External Cache	These two categories speed up memory access. However, this function depends on the CPU/chipset design. The Choice: Enabled, Disabled
CPU L2 Cache ECC Checking	This item allows the user to enable/disable CPU L2 Cache ECC checking. The Choice: Enabled, Disabled
Processor Number Feature	This item allows the user to enable/disable support KLAMATH. The Choice: Enabled, Disabled
Quick Power On Self Test	This category speeds up Power On Self Test (POST) after the user power up the computer. If it is set to Enable, BIOS will shorten or skip some check items during POST. The Choice: Enabled, Disabled
LAN (CN17/UP) BootROM	LAN BootROM contains boot programs that permit diskless workstations to boot from a boot server. If you attach a BootROM, this option can be enabled or disabled The choice: Enabled, Disabled
First/Second/Third/Other Boot Device	The BIOS attempts to load the operating system from the devices in the sequence selected in these items. The Choice: Floppy, LS120, HDD0-3, SCSI, CDROM, ZIP 100 , LAN, Disabled
Swap Floppy Drive	If the system has two floppy drives, the user can swap the logical drive name assignments. The Choice: Enabled/Disabled
Boot Up Floppy Seek	Seeks disk drives during boot up. Disabling speeds boot up. The Choice: Enabled/Disabled
Boot Up NumLock Status	Select power on state for NumLock. The Choice: On/Off
Gate A20 Option	Select if chipset or keyboard controller should control GateA20 Normal: A pin in the keyboard controller controls GateA20 Fast: Lets chipset control GateA20
Typematic Rate Setting	Key strokes repeat at a rate determined by the keyboard controller. When enabled, the typematic rate and typematic delay can be selected. The Choice: Enabled/Disabled
Typematic Rate (Chars/Sec)	Sets the number of times a second to repeat a key stroke when you hold the key down. The Choice: 6, 8, 10, 12, 15, 20, 24, 30
Typematic Delay (Msec)	Sets the delay time after the key is held down before it begins to repeat the keystroke. The Choice: 250, 500, 750, 1000

Table 3-3. Advanced BIOS Menu Selections

Menu Field	Description
Security Option	Select whether the password is required every time the system boots or only when the user enters setup menu System: The system will not boot and access to Setup will be denied if the correct password is not entered at the prompt Setup: The system will boot, but access to Setup will be denied if the correct password is not entered at the prompt Note: To disable security, select PASSWORD SETTING at Main Menu and then the user will be asked to enter password. Do not type anything and just press <Enter>, it will disable security. Once the security is disabled, the system will boot and any user can enter Setup Menu freely
OS Select For DRAM > 64MB	Select the operating system that is running with greater than 64MB of RAM on the system. The Choice: Non-OS2, OS2
Report No FDD For Win 95	Whether report no FDD for Win 95 or not. Choose: Yes or No

Advanced Chipset Features

Phoenix – AwardBIOS CMOS Setup Utility		
Advanced Chipset Features		
SDRAM CAS Latency Time	3	Item Help
SDRAM Cycle Time Tras/Trc	7/9	_____
SDRAM RAS-to-CAS Delay	3	Menu Level ➢
SDRAM RAS Precharge Time	3	
System BIOS Cacheable	Disabled	
Video BIOS Cacheable	Disabled	
Memory Hole At 15M-16M	Disabled	
CPU Latency Timer	Disabled	
Delay Transaction	Enabled	
AGP Graphics Aperture Size	64MB	
Power-Supply Type	AT	
Special NT4.0 DRAM Report	Disabled	
On-Chip VGA	Enabled	
↑↓←→: Move Enter: Select +/-/PU/PD: Value F10:Save ESC: Exit F1:General Help F5: Previous Values F6: Fail-safe defaults F7:Optimized Defaults		

Figure 3-6. Advanced Chipset Features

This section allows the user to configure the system based on the specific features of the installed chipset. This chipset manages bus speeds and access to system memory resources, such as DRAM and the external cache. It also coordinates communications between the conventional ISA bus and the PCI bus. It must be stated that these items should never need to be altered. The default settings have been chosen because they provide the best operating conditions for the system.

Table 3-4. Advanced Chipset Features Menu Selections

Menu Field	Description
DRAM Settings	The first chipset settings deal with CPU access to dynamic random access memory (DRAM). The default timings have been carefully chosen and should only be altered if data has been lost. Such a scenario may occur if the system had mixed speed DRAM chips installed so greater delays may be required to preserve the integrity of the data held in the slower memory chips
SDRAM CAS Latency Time	When synchronous DRAM is installed, the number of clock cycles of CAS latency depends on the DRAM timing. The Choice: 2, 3
SDRAM Cycle Time Tras/Trc	Select the number of SCLKs for an access cycle. The Choice: 5/7, 6/8
SDRAM RAS-to-CAS Delay	This field lets you insert a timing delay between the CAS and RAS strobe signals, used when DRAM is written to, read from, or refreshed. *Fast* gives faster performance; and *Slow* gives more stable performance. This field applies only when synchronous DRAM is installed in the system. The Choice: 2, 3
SDRAM RAS Precharge Time	If an insufficient number of cycles is allowed for the RAS to accumulate its charge before DRAM refresh, the refresh may be incomplete and the DRAM may fail to retain data. *Fast* gives faster performance; and *Slow* gives more stable performance. This field applies only when synchronous DRAM is installed in the system. The Choice: 2, 3.
System BIOS Cacheable	Selecting *Enabled* allows caching of the system BIOS ROM at F0000h-FFFFFh, resulting in better system performance. However, if any program writes to this memory area, a system error may result. The Choice: Enabled, Disabled
Video BIOS Cacheable	Select Enabled allows caching of the video BIOS , resulting in better system performance. However, if any program writes to this memory area, a system error may result. The Choice: Enabled, Disabled
Memory Hole At 15M-16M	You can reserve this area of system memory for ISA adapter ROM. When this area is reserved, it cannot be cached. The user information of peripherals that need to use this area of system memory usually discusses their memory requirements. The Choice: Enabled, Disabled
CPU Latency Timer	Enabled : CPU cycle will only be Deferred after in has been in a "Snoop Stall" for 31 clocks and another ADS# has arrived. Disabled: CPU cycle will only be Deferred immediately after the GMCH receives another ADS#. The Choice: Enabled, Disabled
Delay Transaction	The chipset has an embedded 32-bit posted write buffer to support delay transactions cycles. Select *Enabled* to support compliance with PCI specification version 2.1. The Choice: Enabled, Disabled
Power-Supply Type	You can choose your power supply type with this option. The choice: AT, ATX
Special NT 4.0 DRAM Report	You can choose to enable or disable the NT 4.0 DRAM report. The choice: Disabled, Enabled
On-Chip VGA	You can enable or disable the on-chip VGA. The choice: Enabled, Disabled

Integrated Peripherals

Phoenix – AwardBIOS CMOS Setup Utility		
Integrated Peripherals		
On-Chip Primary PCI IDE	Enabled	Item Help
On-Chip Secondary PCI IDE	Enabled	⎯⎯⎯⎯⎯⎯⎯
IDE Primary Master PIO	Auto	Menu Level ➢
IDE Primary Slave PIO	Auto	If your IDE hard
IDE Secondary Master PIO	Auto	drive supports block
IDE Secondary Slave PIO	Auto	mode select Enabled
IDE Primary Master UDMA	Auto	for automatic
IDE Primary Slave UDMA	Auto	detection of the
IDE Secondary Master UDMA	Auto	optimal number of
IDE Secondary Slave UDMA	Auto	block read/write per
USB Controller	Disabled	sector the drive can
USB Keyboard Support	Disabled	support
Init Display First	PCI Slot	
AC97 Audio	Auto	
IDE HDD Block Mode	Enabled	
POWER ON Function	BUTTON ONLY	
X KB Power ON Password	Enter	
X Hot Key Power ON	Ctrl-F1	
Onboard FDC Controller	Enabled	
Onboard Serial Port 1	3F8/IRQ4	
Onboard Serial Port 2	2F8/IRQ3	
UART Mode Select	Normal	
X UR2 Duplex Mode	Half	
Onboard Parallel Port	378/IRQ7	
Parallel Port Mode	SPP	
X ECP Mode Use DMA	3	
PWRON After PWR-Fail	Off	
Watch Timer Unit Select	Second	
↑↓←→: Move Enter: Select +/-/PU/PD: Value F10:Save ESC: Exit F1: General Help F5: Previous Values F6: Fail-safe defaults F7: Optimized Defaults		

Figure 3-7.Integrated Peripherals Submenu

Table 3-5. Integrated Peripherals Menu Selections

Menu Field	Description
On-Chip Primary/Secondary PCI IDE	The integrated peripheral controller contains an IDE interface with support for two IDE channels. Select *Enabled* to activate each channel separately. The Choice: Enabled, Disabled
IDE Primary/Secondary Master/Slave PIO	The four IDE PIO (Programmed Input/Output) fields let you set a PIO mode (0-4) for each of the four IDE devices that the onboard IDE interface supports. Modes 0 through 4 provide successively increased performance. In Auto mode, the system automatically determines the best mode for each device. The Choice: Auto, Mode 0, Mode 1, Mode 2, Mode 3, Mode 4
IDE Primary/Secondary Master/Slave UDMA	Ultra DMA-33/66 implementation is possible only if user's IDE hard drive supports it and the operating environment includes a DMA driver (Windows 95 OSR2 or a third-party IDE bus master driver). If user's hard drive and the system software both support Ultra DMA-33/66, select Auto to enable BIOS support. The Choice: Auto, Disabled
USB Controller	Select *Enabled* if the system contains a Universal Serial Bus (USB) controller as well as the presence of USB peripherals. The Choice: Enabled, Disabled
USB Keyboard Support	Select *Enabled* if the system contains a Universal Serial Bus (USB) controller as well as the presence of a USB keyboard. The Choice: Enabled, Disabled
Init Display First	This BIOS feature allows you to select whether to boot the system using the AGP graphics card or the PCI graphics card. This is particularly important if you have AGP and PCI graphics cards but only one monitor. The choice: PCI Slot; Onboard/AGP
AC97 Audio	This item allows the user to decide to enable/disable the 810E chipset family to support AC97 Audio. The Choice: Auto, Disabled
IDE HDD Block Mode	Block mode is also called block transfer, multiple commands, or multiple sector read/write. If user's IDE hard drive supports block mode (most new drives do), select Enabled for automatic detection of the optimal number of block read/writes per sector the drive can support. The Choice: Enabled, Disabled
POWER ON Function	The Power On function allows you to set the method of waking your system. The choice: Password, Hot KEY, Mouse move, Any KEY, BUTTON ONLY, keyboard 98
Onboard FDC Controller	Select Enabled if the system has a floppy disk controller (FDC) installed on the system board and the user wishes to use it. If the user install and-in FDC or the system that has no floppy drive, please select Disabled in this field. The Choice: Enabled, Disabled
Onboard Serial Port 1/Port 2	Select an address and corresponding interrupt for the first and second serial ports. The Choice: 3F8/IRQ4, 2E8/IRQ3, 3E8/IRQ4, 2F8/IRQ3, Disabled, Auto
UART Mode Select	Select a serial port 2 operation mode. The Choice: Normal, IrDA, ASKIR, SCR
Onboard Parallel Port	Select an address and corresponding interrupt for the parallel ports. The Choice: 378/IRQ7, 278/IRQ5, 3BC/IRQ7, Disabled

Table 3-5. Integrated Peripherals Menu Selections

Menu Field	Description
Parallel Port Mode	Select a parallel operation mode. The Choice: SPP, EPP, ECP,ECP+EPP
PWERON After PWR-Fail	Select the method to power on your unit after a power failure. The choice: Off, On
Watchdog Timer Unit Select	Select the Watch Dog Timer unit. The Choice: Second, Minute

Power Management Setup

The Power Management Setup allows the user to configure the system to the most efficient energy saving mode while operating in a user defined system environment.

Phoenix – AwardBIOS CMOS Setup Utility		
Power Management Setup		
ACPI Function	Disabled	Item Help
ACPI Suspend Type	S1 (POS)	_____
X Run VGABIOS if S3 Resume	Auto	Menu Level ➢
Power Management	User Define	
Video Off Method	DPMS	
Video Off In Suspend	Yes	
Suspend Type	Stop Grant	
MODEM Use IRQ	NA	
Suspend Mode	Disabled	
HDD Power Down	Disabled	
Soft-Off by PWR-BTTN	Instant-Off	
Wake Up on LAN/Ring	Enabled	
Resume by Alarm	Disabled	
X Date (of Month) Alarm	0	
X Time (hh:mm:ss) Alarm	0 : 0 : 0	
** Reload Global Timer Events **		
Primary IDE 0	Disabled	
Primary IDE 1	Disabled	
Secondary IDE 0	Disabled	
Secondary IDE 1	Disabled	
FDD,COM,LPT Port	Disabled	
PCI, PIRQ[A-D]#	Disabled	
↑↓←→: Move Enter: Select +/-/PU/PD: Value F10:Save ESC: Exit F1:General Help		
F5: Previous Values F6:Fail-safe defaults F7: Optimized Defaults		

Figure 3-8. Power management setup

Table 3-6. Power Management Setup Features

Menu Field	Description
ACPI Function	This setting allows you to tell the system to shutdown automatically when the system is powered off.
	The choice: Disabled, Enabled
ACPI Suspend Type	This setting allows you to choose how the system will suspend.
	The choice: S1 (POS), S3 (STR), S1 & S3
Power Management	There are four selections for Power Management, three of which have fixed mode settings. This category allows you to select the type (or degree) of power saving and is directly related to the following modes:
	HDD Power Down; Doze Mode; Suspend Mode
Disable (default)	No power management. Disables all four modes
Min. Power Saving	Minimum power management. Doze Mode = 1 hr. Standby Mode = 1 hr., Suspend Mode = 1 hr., and HDD Power Down = 15 min
Max. Power Saving	Maximum power management -- **ONLY AVAILABLE FOR SL CPU's**. Doze Mode = 1 min., Standby Mode = 1 min., Suspend Mode = 1 min., and HDD Power Down = 1 min
User Defined	Allows you to set each mode individually. When not disabled, each of the ranges are from 1 min. to 1 hr. except for HDD Power Down which ranges from 1 min. to 15 min. and disable
Video Off Method	This option determines the manner in which the monitor is blanked
V/H SYNC+Blank	This selection will lead system to turn off the vertical and horizontal synchronization ports and write blanks to the video buffer.
Blank Screen	This option only writes blanks to the video buffer
DPMS	Initial display power management signaling
Video Off In Suspend	This determines the manner in which the monitor will go blank.
	The Choice: Yes, No
Suspend Type	Select the Suspend Type.
	The Choice: PWRON Suspend, Stop Grant
MODEM Use IRQ	This setting determines the interrupt request for the modem.
	The choice: NA, 3, 4, 5, 7, 9, 10, 11
Suspend Mode	When enabled and after the set time of system inactivity, all devices except the CPU will be shut off.
	The Choice: 1Min, 2Min, 4Min, 8Min, 12Min, 20Min, 30Min, 40Min, 1Hour, Disabled
HDD Power Down	When enabled and after the set time of system inactivity, the hard disk drive will be powered down while all other devices remain active.
	The Choice: 1Min, 2Min, 3Min, 4Min, 5Min, 6Min, 7Min, 8Min, 9Min, 10Min, 11Min, 12Min, 13Min, 14Min, 15Min, Disabled
Soft-Off by PWR-BTTN	This setting allows you to choose how quickly the system will shut-down when the power button is pressed.
	The choice: Instant-Off, Delay 4-sec
Wake Up On LAN/Ring	Setting this option to enabled will wake up the system on LAN/Ring
	The choice: Enabled, Disabled
Resume by Alarm	Setting this option to enabled will cause the system to resume by alarm
	The choice: Disabled, Enabled
PM EVENTS	PM events are I/O events whose occurrence can prevent the system from entering a power saving mode or can awaken the system from such a mode. In effect, the system remains alert for anything which occurs in a device when configured *Enabled*, even when the system is in a power down mode.
	Options: Primary IDE 0; Primary IDE 1; Secondary IDE 0; Secondary IDE 1; FDD, COM, LPT Port ; PCI PIRQ[A-D] #

PnP/PCI Configuration Setup

This section describes configuring the PCI bus system. PCI, or **P**ersonal **C**omputer **I**nterconnect, is a system which allows I/O devices to operate at speeds nearing the speed the CPU itself uses when communicating with its own special components. This section covers some very technical items and it is strongly recommended that only experienced users should make any changes to the default settings.

Phoenix – AwardBIOS CMOS Setup Utility		
PnP/PCI Configurations		
Reset Configuration Data	Disabled	Item Help

Resources Controlled By	Auto(ESCD)	Menu Level ➢
X IRQ Resources	Press Enter	
X DMA Resources	Press Enter	Default is Disabled. Select Enabled to reset Extended System Configuration Data(ESCD) when you exit Setup if you have installed a new add-on and the system reconfiguration has caused such a serious conflict that the OS cannot boot
PCI/VGA Palette Snoop	Disabled	
PCI Latency Timer (CLK)	32	
↑↓←→Move Enter: Select +/-/PU/PD: Value F10:Save ESC: Exit F1:General Help		
F5: Previous Values F6:Fail-safe defaults F7:Optimized Defaults		

Figure 3-9. PnP/PCI Configuration Setup

Table 3-7. PnP/PCI Configuration Setup Menu Selections

Menu Field	Description
Reset Configuration Data	Normally, you leave this field Disabled. Select Enabled to reset Extended System Configuration Data (ESCD) when you exit Setup if you have installed a new add-on and the system reconfiguration has caused such a serious conflict that the operating system cannot boot. The Choice: Enabled, Disabled
Resource controlled by	The Award Plug and Play BIOS has the capacity to automatically configure all of the boot as well as Plug and Play compatible devices. However, this capability means absolutely nothing unless you are using a Plug and Play operating system such as Windows® 95. If you set this field to "manual," you can choose specific resources by going into each of the sub menu that follows this field (a sub menu is preceded by a "➢"). The Choice: Auto(ESCD), Manual
IRQ Resources	When resources are controlled manually, assign each system interrupt a type, depending on the type of device using the interrupt. The choices: IRQ3, IRQ 4, IRQ 5, IRQ 7, IRQ 9, IRQ 10, IRQ 11, IRQ 12, IRQ 14, IRQ 15 For each IRQ, you may determine the type of device assigned to the IRQ. The choice: PCI/ISA Device, Legacy ISA
DMA Resources	When resources are controlled manually, you can assign each memory object a type The choices: DMA0, DMA1, DMA3, DMA5, DMA5, DMA6, DMA7
	For each DMA, you may determine the type of device assigned to the DMA. The choices: PCI/ISA Device, Legacy ISA
PCI/VGA Palette Snoop	Leave this field at *Disabled*. The Choice: Enabled, Disabled
PCI Latency Timer (CLK)	PCI latency timers are a mechanism for PCI bus-mastering devices to share the PCI bus fairly. The minimum amount you can set is 0; the maximum is 255. You are prompted to key in a decimal number to set the timer.

Frequency/Voltage Control

Phoenix – AwardBIOS CMOS Setup Utility	
Frequency/Voltage Control	
Auto Detect DIMM/PCI Clk Disabled Spread Spectrum Disabled CPU Host/PCI Clock 133/33MHz CPU Clock Ratio X 4	Item Help ------------------------- Menu Level ➢
↑↓←→ Move Enter: Select +/-/PU/PD: Value F10:Save ESC: Exit F1:General Help F5: Previous Values F6: Fail-safe defaults F7: Optimized Defaults	

Figure 3-10.Frequency/Voltage Control

Table 3-8. Frequency/Voltage Control Menu Selections

Menu Field	Description
Auto Detect DIMM/PCI Clk	This item allows you to enable/disable auto detect DIMM/PCI Clock. The Choice: Enabled, Disabled
Spread Spectrum	This item allows you to enable/disable the spread spectrum modulate. The Choice: Enabled, Disabled
CPU Host / PCI Clock	This item allows you to select CPU Host and PCI clock. The Choice: Default,130/33,133/33,137/34,140/35,145/36,150/38(M)
CPU Clock Ratio	This item allows you to select CPU clock ratio. The Choice: 4, 4.5, 5, 5.5, 6, 6.5, 7, 7.5, 8, 8.5, 9, 9.5, 10, 10.5, 11, 11.5, 12

Defaults Menu

Selecting "Defaults" from the main menu shows you two options which are described below

Load Fail-Safe Defaults

When you press <Enter> on this item you will get a confirmation dialog box with a message similar to:

Load Fail-Safe Defaults (Y/N)? N

Pressing 'Y' loads the BIOS default values for the most stable, minimal-performance system operations.

Load Optimized Defaults

When you press <Enter> on this item you get a confirmation dialog box with a message similar to:

Load Optimized Defaults (Y/N)? N

Pressing 'Y' loads the default values that are factory settings for optimal performance system operations.

Supervisor/User Password Setting

You can set either supervisor or user password, or both. The differences are:

Supervisor Password: Users with is password can enter Setup Menu as well as settings.

User Password: Users with this password can only enter the Setup Menu but do not have the right to change any setting. When you select this function, the following message will appear at the center of the screen to guide you in creating a password.

ENTER PASSWORD:

Type the password, up to eight characters in length, and press <Enter>. The password typed now will clear any previously entered password from CMOS memory. You will be asked to confirm the password. Type the password again and press <Enter>. You may also press <Esc> to abort the selection and not enter a password.

To disable a password, just press <Enter> when you are prompted to enter the password. A message will confirm the password will be disabled. Once the password is disabled, the system will boot and anyone can enter Setup Menu and change setting at their will.

PASSWORD DISABLED.

When a password has been enabled, you will be prompted to enter it every time you try to enter Setup. This prevents an unauthorized person from changing any part of your system configuration.

Additionally, when a password is enabled, you can also require the BIOS to request a password every time your system is rebooted. This would prevent unauthorized use of your computer.

You determine when the password is required within the BIOS Features Setup Menu and its Security option (see Section 3). If the Security option is set to password will be required both at boot and at entry to Setup. If set to "Setup", prompting only occurs when trying to enter Setup.

Exit Selecting

Save & Exit Setup

Pressing <Enter> on this item asks for confirmation:

Save to CMOS and EXIT (Y/N)? Y

Pressing "Y" stores the selections made in the menus in CMOS – a special section of memory that stays on after you turn your system off. The next time you boot your computer, the BIOS configures your system according to the Setup selections stored in CMOS. After saving the values the system is restarted again.

Exit Without Saving

Pressing <Enter> on this item asks for confirmation:

Quit without saving (Y/N)? Y

This allows you to exit Setup without storing in CMOS any change. The previous selections remain in effect. This exits the Setup utility and restarts your computer.

Chapter 4 Troubleshooting

This chapter covers the procedures for reinstalling operating systems and installing the various drivers.

Reinstalling Operating Systems

The 1504 CPU ships with either Windows® 2000 or Windows® XP operating systems installed. If you want to install a different operating system, refer to that operating system's manual for directions. You may also request that no operating be installed on your 1504 unit.

Windows® 2000 Reinstallation

If you need to reinstall the Windows® 2000 operating system, refer to the *Xycom Automation Workstation Recovery Media Software Installation Instructions for Microsoft® Windows 2000* (shipped with systems preinstalled with Windows® 2000). This document is devoted to the reinstallation of your Microsoft® Windows® 2000 operating system and drivers utilizing the Recovery Media provided with your Xycom Automation industrial computer.

NOTE

This procedure assumes that the computer hard disk drive has been completely corrupted or replaced.

WARNING

This procedure will destroy data that may exist on the hard disk drive.

Windows® XP Reinstallation

If you need to reinstall Windows® XP, and need to reinstall your operating system, refer to the *Xycom Recovery for Xycom Automation Windows® XP Workstation* (shipped with systems preinstalled with Windows® XP*).* This document is devoted to the reinstallation of your Windows XP Workstation 4.0 operating system and drivers utilizing the Recovery Media provided with your Xycom Automation industrial computer.

NOTE

This procedure assumes that the computer hard disk drive has been completely corrupted or replaced.

WARNING

This procedure will destroy data that may exist on the hard disk drive.

Note

If you need to reinstall the Windows® XP or Windows® 2000 operating system, you must have an internal CD-ROM drive or an external parallel port CD-ROM drive. Windows XP ships *only* on a CD-ROM disk.

Installing Drivers

This section describes how to install the drivers associated with the 1504. Information about installing drivers for your computer is included in the *Documentation and Support Library* CD shipped with your computer, or on the web at www.xycom.com.

Ethernet Drivers

Note

If you want to use Ethernet capabilities with Windows 2000, your system must have BIOS revision level 1.1 or higher.

If you install Windows® on your system, Xycom provides the Ethernet drivers. They can be found on the Ethernet Drivers disk that ships with your system, on the *Support Library* CD, or on the web at www.xycom.com.

Video Drivers

Video drivers for each operating system are on the diskettes included with the documentation kit. Drivers are also included on the *Documentation and Support Library CD* or on the web at www.xycom.com. To install a video driver, refer to the INSTALL.TXT file on the diskette for your operating system.

CD-ROM Drivers

A CD-ROM driver disk comes with the CD-ROM option, as well as the preinstalled driver for the operating system you have selected. Drivers are also included on the *Documentation and Support Library CD* or on the web at www.xycom.com. If you change operating systems and need help loading the required CD-ROM driver, contact Xycom Technical Support at 1-734-944-0482, or via email at support@xycom.com .

Miscellaneous Drivers

Refer to your operating system and peripheral manuals for information on installing drivers. See the *Documentation and Support Library CD,* or the web address [www.xycom.com,](www.xycom.com) for drivers associated with Xycom equipment and software.

Chapter 5 Maintenance

The 1504 was designed to withstand the harsh environment of the factory floor. Routine maintenance can help keep your 1504 in good operating condition. Preventive maintenance consists of several basic procedures that significantly reduce the chance of system malfunction. Schedule preventive maintenance along with the regular equipment maintenance to minimize 1504 down time.

General Preventive Maintenance

Preventive maintenance consists of several basic procedures that will reduce the chance of system malfunction. Schedule preventive maintenance along with the regular equipment maintenance to minimize down time.

The following are some preventive measures you can take to keep your unit in good working order:

- *Clean the fan filter periodically* to ensure that the air circulating in the unit is clean. Wash the filter with warm water and dish soap, and let it air dry. Do not scrub the filter, and do not re-install it into the unit until it is completely dry.

- *Base your maintenance schedule* on the operating environment of the system. If the area is dusty, you should schedule maintenance more often than if it is a dry, clean area. Check the filter often to determine if it needs to be changed ahead of schedule.

- *Remove dust and dirt from PC components.* If dust builds up on heat sinks and circuitry, an obstruction of heat dissipation could cause the unit to malfunction. If dust reaches the electronic boards, a short circuit could occur.

- *Check the connections to I/O modules*, especially in environments where shock could loosen the connections. Check to see that all plugs, sockets, terminal strips, and module connections are secure.

- *Remove unnecessary articles*, such as drawings or manuals, from the unit. They can obstruct airflow and create hot spots, which causes the system to malfunction.

- *Do not place* noise-generating equipment near the 1504.

- *Stock spare parts* to minimize down time resulting from part failure. The spare parts stocked should be 10 percent of the number of each unit used. The main CPU cards should have one spare each. Each power supply should have a back up. In certain applications where immediate operation of a failed system is required, you may need to stock a spare computer module.

- *Replace the module with the correct type.* If the new module solves the problem but the failure recurs, check for inductive loads that may be generating voltage and current spikes and may require external suppression.

Caution

Do not operate the 1504 without a fan filter. Dust build-up could cause the unit to malfunction.

Xycom Recommended Hard Drive Preventive Maintenance

Xycom Automation has recognized that hard drive failures may begin to increase an average of four to five years into the life of most computers used in industrial applications. Therefore, it is our recommendation as a preventive maintenance measure that all hard drives used in these types of applications be replaced before the four to five year time period to avoid any down time related to hard drive failure.

Xycom believes it is important to keep our customers informed, to offer alternative solutions, and to provide all of our customers with the excellent service they deserve.

Any questions regarding this issue may be directed to our support center at support@xycom.com.

Replacing the Fuse

The 1504 has no accessible fuse. Return the unit to Xycom for fuse replacement.

Replacing the Fan Filter

The fan grill is secured to the unit by a thumbscrew at the stop (see Figure 1-2 for the position of the fan). The bottom edge of the grill is hinged. To change the fan filter, loosen the thumbscrew and pull the grill down. Remove the filter (which is not secured to the unit) and replace it. Then push the grill back into position and tighten the thumbscrew.

Product Repair Program

Xycom's Product Repair & Customization Department (PR&C) restores equipment to normal operating condition and implements engineering changes that enhance operating specifications. Xycom tests products returned to Xycom with the standard Xycom test diagnostics.

Follow the steps below to prepare the unit for shipment:

1. Obtain a Return Merchandise Authorization (RMA) number for your unit by calling your nearest Xycom Automation Repair Department or Xycom Automation, Inc. at 734-429-4971.

2. Please have the following information available:

   - Company name, shipping and billing address
   - Type of service desired - product repair or product exchange
   - Product model number, part number, quantity, serial number(s), and warranty status
   - Failure mode and failure systems
   - Purchase order number or repair order number

3. Attach failure information to the unit to speed processing.

4. Place the unit securely in its original packaging or an equivalent heavy-duty box.

5. Mark the RMA number on your purchase order and on the outside of the box.

6. Send the unit to the address given when you receive your RMA number.

Appendix A Technical Specifications

Hardware Specifications

The following table outlines the hardware specifications for the 1504 node box.

Table A - 1. 1504 Hardware Specifications

Characteristic	Specification	
Mechanical Height Width Depth Weight	**Horizontal Mounting attached)** 7.34" (186.5 mm) 9.92" (252.0 mm) 8.23" (209.0 mm) 21 lbs (9.5 kgs)	**Vertical Mounting (with brackets** 8.60" (218.5 mm) 8.23" (209.0 mm) 15.49" (393.5 mm)
Power Supply	150W AC	
Input Rating	100-132/200-240V AC, 50-60 Hz, 4A (maximum)	
Passive Backplane	6 slots: One full length ISA expansion slot One full length PCI bus expansion slot One half PCI bus expansion slot	
Mounting	Shelf or panel, horizontal or vertical mount.	
Agency Approvals	UL 508 Listed cUL CSA C22.2, no. 142, Listed	

Regulatory Compliance	FCC 47 CFR, Part 15, Class A
	CE: EMI EN55022: Class A
	     IMMUNITY EN61000-6-2
	     HARMONICS EN61000-3-2, Class A
	     FLICKER EN61000-3-3
	     SAFETY EN60950	

ISO 9001	The manufacturing facility at Xycom Automation, Inc. is ISO certified and is accredited by ANSI-RAB and the RvA.	

143580(A)

Environmental Specifications

The following table outlines the environmental specifications for the 1504 node box.

Table A - 2. 1504 Environmental Specifications

Characteristic	Specification
Temperature Operating	0° to 50° C (32° to 122° F)
Nonoperating	-40° to 60°C (-40° to 140°F)
Humidity Operating	20% to 80% RH noncondensing
Nonoperating	5% to 95% RH noncondensing
Altitude[a] Operating	Sea level to 10,000 feet (3048 m)
Nonoperating	Sea level to 40,000 feet (12192 m)
Vibration[b] Operating	5-2000 Hz, 0.006" peak to peak displacement 1.0g maximum acceleration
Nonoperating (packaged)	5-2000 Hz, 0.015" peak-to-peak displacement 2.5 g maximum acceleration
Shock[b] Operating	15g peak acceleration, 11 msec duration
Nonoperating (packaged)	30g peak acceleration, 11 msec duration

[a] *Consistent with internal component specifications.*

[b] *These values are with solid-state hard drives and **not** rotating media drives.*

Note

CD-ROM and standard hard disk drives should not be used in applications where high levels of shock and vibration are present.

If a CD-ROM drive is installed, the shock and vibration specifications of the 1504 are limited to the shock and vibration specifications of the   CD-ROM drive.

Appendix B Jumper Settings

This appendix describes the jumper settings for the various 1504 features. Refer to Figure 3-1 for a mechanical drawing of the SCB-375 motherboard, showing the locations of all jumpers and connectors.

Clear CMOS Setup

If the user wants to clear the CMOS Setup(for example forgot the password, the user should clear the original setup and reset the password), the user should close JP1 for about 3 seconds, then open it. To set back to normal operation mode, please open JP1.

• *JP1: Clear CMOS Setup*

JP1	DESCRIPTION
1-2	Keep CMOS Setup (Normal Operation)
2-3	Clear CMOS Setup

BIOS Protection Setting

To protect the BIOS from writing, place the cap on the location 2-3.

• *JP2: Flash Protection Setting*

JP2	DESCRIPTION
2-3	Locked
1-2	Unlocked

Keyboard Power Selection

• *JP4: Keyboard Power Selection*

JP4	DESCRIPTION
1-2	VCC
2-3	5VSB

Compact Flash Card Master/Slave Mode Setting

• *JP3: Master/Slave Mode Setting*

JP3	DESCRIPTION
OPEN	SLAVE
SHORT	MASTER

Appendix C Pinouts

This appendix describes the pinouts for the internal cable connections on the 1504 unit. Refer to Figure 3-1 for a mechanical drawing of the SCB-375 motherboard, showing the locations of all jumpers and connectors.

Floppy Disk Drive Connector

SBC-375 board equipped with a 34-pin daisy-chain driver connector cable.

CN3: FDC CONNECTOR

Table C - 1. FDC Connector Pinout

PIN	DESCRIPTION	PIN	DESCRIPTION
1	GROUND	2	REDUCE WRITE
3	GROUND	4	NC
5	GROUND	6	NC
7	GROUND	8	INDEX#
9	GROUND	10	MOTOR ENABLE A#
11	GROUND	12	DRIVE SELECT B#
13	GROUND	14	DRIVE SELECT A#
15	GROUND	16	MOTOR ENABLE B#
17	GROUND	18	DIRECTION#
19	GROUND	20	STEP#
21	GROUND	22	WRITE DATA#
23	GROUND	24	WRITE GATE#
25	GROUND	26	TRACK 0#
27	GROUND	28	WRITE PROTECT#
29	NC	30	READ DATA#
31	GROUND	32	SIDE 1 SELECT#
33	NC	34	DISK CHANGE#

NC stands for No Connection

Ultra ATA33/66/100 IDE Disk Drive Connector

The user can attach two IDE (Integrated Device Electronics) hard drives to the SBC-375 IDE controller.

CN1 (IDE 1): Primary IDE Connector

CN7 (IDE 2): Secondary IDE Connector

Table C - 2. IDE Connector pinouts

PIN	DESCRIPTION	PIN	DESCRIPTION
1	RESET#	2	GROUND
3	DATA 7	4	DATA 8
5	DATA 6	6	DATA 9
7	DATA 5	8	DATA 10
9	DATA 4	10	DATA 11
11	DATA 3	12	DATA 12
13	DATA 2	14	DATA 13
15	DATA 1	16	DATA 14
17	DATA 0	18	DATA 15
19	GROUND	20	NC
21	NC	22	GROUND
23	IOW#	24	GROUND
25	IOR#	26	GROUND
27	NC	28	BALE - DEFAULT
29	NC	30	GROUND - DEFAULT
31	INTERRUPT	32	IOCS16#-DEFAULT
33	SA1	34	N/C
35	SA0	36	SA2
37	HDC CS0#	38	HDC CS1#
39	HDD ACTIVE#	40	GROUND

NC stands for No Connection

Parallel Port

This port is usually connected to a printer, The SBC-375's on-board parallel port is accessed through a 26-pin flat-cable connector CN9. Three modes are supported: SPP, EPP, and ECP.

CN9: Parallel Port Connector

Table C - 3. Parallel Port Connector Pinout

PIN	DESCRIPTION	PIN	DESCRIPTION
1	STROBE#	2	DATA 0
3	DATA 1	4	DATA 2
5	DATA 3	6	DATA 4
7	DATA 5	8	DATA 6
9	DATA 7	10	ACKNOWLEDGE
11	BUSY	12	PAPER EMPTY
13	PRINTER SELECT	14	AUTO FORM FEED #
15	ERROR#	16	INITIALIZE
17	PRINTER SELECT LN#	18	GROUND
19	GROUND	20	GROUND
21	GROUND	22	GROUND
23	GROUND	24	GROUND
25	GROUND	26	NC

NC stands for No Connection

Serial Ports

The SBC-375 offers two high speed NS16C550 compatible serial ports with Read/Receive 16 byte FIFO serial ports.

CN2: COM1 10-pin Connector

Table C - 4. COM1 Connector Pinout

PIN	DESCRIPTION	
1	DATA CARRIER DETECT	(DCD)
2	RECEIVE DATA	(RXD)
3	TRANSMIT DATA	(TXD)
4	DATA TERMINAL READY	(DTR)
5	GROUND	
6	DATA SET READY	(DSR)
7	REQUEST TO SEND	(RTS)
8	CLEAR TO SEND	(CTS)
9	RING INDICATOR	(RI)
10	NC	

NC stands for No Connection

CN8: COM2 10-pin Connector

Table C - 5. COM2 connector pinout

PIN	DESCRIPTION	
1	DATA CARRIER DETECT	(DCD)
2	RECEIVE DATA	(RXD)
3	TRANSMIT DATA	(TXD)
4	DATA TERMINAL READY	(DTR)
5	GROUND	
6	DATA SET READY	(DSR)
7	REQUEST TO SEND	(RTS)
8	CLEAR TO SEND	(CTS)
9	RING INDICATOR	(RI)
10	NC	

NC stands for No Connection

Keyboard Connector

The SBC-375 provides 5-PIN Header and 6-PIN keyboard/mouse connector.

CN23: 6-pin Keyboard/Mouse Connector

Table C - 6. Keyboard/mouse connector pinout

PIN	DESCRIPTION
1	+5V
2	MOUSE DATA
3	MOUSE CLOCK
4	KEYBOARD DATA
5	KEYBOARD CLOCK
6	GROUND

CN22: 5-pin Keyboard Connector

Table C - 7. Keyboard connector pinout

PIN	DESCRIPTION
1	KEYBOARD CLK
2	KEYBOARD DATA
3	NC
4	GROUND
5	+5V

NC stands for No Connection

USB Port Connector

The SBC-375 provides two USB ports.

CN6:

Table C - 8. CN6 Pinout

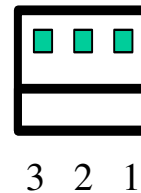| Pin	Description
1	VCC
2	GROUND
3	DATA-
4	DATA+
5	DATA+
6	DATA-
7	GROUND
8	VCC
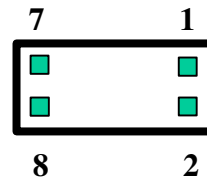
Fan Connector

The SBC-375/ EVG provides CPU cooling fan connector. CPU connectors can supply 12V/500mA of power to the cooling fan. The fan's rotation is in full speed.

FAN2/FAN3: CPU Fan Connector

Table C - 9. CPU Fan Connector Pinout

PIN	DESCRIPTION
3	Sensor
2	12V
1	Ground

LAN RJ45 Connector

SBC-375 is equipped with a 10/100Mbps Ethernet Controller. The user can connect it to a LAN through RJ45 LAN connector. The pin assignments are shown in the following table:

CN17: LAN RJ45 Connector

Table C - 10. LAN RJ45 connector pinout

PIN	DESCRIPTION	PIN	DESCRIPTION
1	TX+	5	NC
2	TX-	6	RX-
3	RX+	7	NC
4	NC	8	NC

NC stands for No Connection

CN12: LAN LED Connector

<p align="center">Table C - 11. LAN LED connector pinout</p>

Pin	Description	Pin	Description
1	100ACT+	2	100ACT-
3	100LINK+	4	100LINK-

VGA Connector

SBC-375 built-in 15-pin VGA connector directly to user's CRT monitor.

CN11: 15-pin Female Connector

<p align="center">Table C - 12.VGA connector pinout</p>

Pin	Description	Pin	Description
1	RED	2	GREEN
3	BLUE	4	NC
5	GROUND	6	GROUND
7	GROUND	8	GROUND
9	NC	10	GROUND
11	NC	12	DDC DAT
13	HSYNC	14	VSYNC
15	DDCCLK		

NC stands for No Connection

Audio Connectors

The AC'97 compliant CODEC supports several audio functions. The connector is described below.

CN14: AUDIO CONNECTOR

<p align="center">Table C - 13. Audio Connector Pinout</p>

Pin	Description
1	LEFT SPEAKER OUT SIGNAL (WITH OP AMPLIFIER)
2	RIGHT SPEAKER OUT SIGNAL (WITH OP AMPLIFIER)
3	GROUND (FOR SPK CONNECTOR)
4	GROUND (FOR LINE OUT CONNECTOR)
5	LEFT LINE OUT SIGNAL
6	RIGHT LINE OUT SIGNAL
7	LEFT LINE IN SIGNAL
8	RIGHT LINE IN SIGNAL
9	GROUND (FOR LINE IN CONNECTOR)
10	GROUND (NO USE)
11	MIC IN
12	GROUND (FOR MIC IN CONNECTOR)

CN13: CD-IN

Table C - 14. CD-IN Connector Pinout

Pin	Description
1	CD LEFT SIGNAL
2	GROUND
3	GROUND
4	CD RIGHT SIGNAL

CN16: Left/Right Audio Line Output Connector for Headphone

Table C - 15. Audio Line Output Connector Pinout

Pin	Description
1	GROUND
2	LEFT SIGNAL (SPK LEFT)
3	NC
4	RIGHT SIGNAL (SPK RIGHT)
5	NC

NC stands for No Connection

External Switches and Indicators

There are several external switches and indicators for monitoring and controlling your CPU board. All the functions are in the CN24 connector.

CN24: Multi Panel

Table C - 16. Multi Panel Connector Pinout

PIN	DESCRIPTION	PIN	DESCRIPTION
1	POWER-LED +	2	SPEAKER -
3	NC	4	NC
5	POWER-LED -	6	NC
7	NC	8	SPEAKER +5V
9	HDD LED +	10	RESET SW
11	HDD LED -	12	RESET SW GND

NC stands for No Connection

CN5: ATX Power Switch Connector

Table C - 17. ATX Power Switch Connector Pinout

PIN	DESCRIPTION
1	PWR_BUTTON+
2	Ground

CN20: ATX Power +5VSB and PSON# Connector

Table C - 18. ATX Power Connector Pinout

PIN	DESCRIPTION
3	Ground
2	PSON#
1	+5VSB

3   2   1
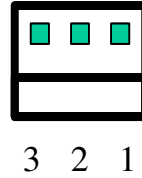
ATX Power Connector

The SBC-375 can work without a backplane, when attached to external power through the following ATX power connector.

CN21: ATX Power Supply Connector
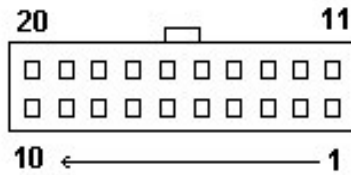
Figure C - 1. ATX power supply connector

CN21 is a 20-pin ATX Power Supply Connector. Please refer to the following table for the pin assignments.

Table C - 19. ATX Power Supply Connector Pinout

PIN	DESCRIPTION	PIN	DESCRIPTION
11	3.3V	1	3.3V
12	-12V	2	3.3V
13	GND	3	GND
14	PSON#	4	+5V
15	GND	5	GND
16	GND	6	+5V
17	GND	7	GND
18	-5V	8	Power good
19	+5V	9	+5VSB
20	+5V	10	+12V

Appendix D Watch Dog Timer

The Watchdog Timer is provided to ensure that standalone systems can always recover from catastrophic conditions that cause the CPU to crash. This condition may have occurred by external EMI or a software bug. When the CPU stops working correctly, hardware on the board cam be programmed to either perform a hardware reset (cold boot) or a Non-Maskable Interrupt (NMI) to bring the system back to a known state.

A BIOS function call (INT 15H) is used to control the Watchdog Timer:

The following table explains how INT 15H works:

AH – 6FH	
Sub-function:	
AL – 2:	Set the Watchdog Timer's period
BL:	Time-out value(Its unit--second or minute, is ependent on the item "Watchdog Timer unit select" in CMOS setup).

You have to call sub-function 2 to set the time-out period of the Watch Dog Timer first. If the time-out value is not zero, the Watchdog Timer will start counting down. When the timer value reaches zero, the system will reset. To ensure that this reset condition does not occur, the Watchdog Timer must be periodically refreshed by calling sub-function 2. However the Watchdog timer will be disabled if you set the time-out value to be zero.

A tolerance of at least 10% must be maintained to avoid unknown routines within the operating system (DOS), such as disk I/O that can be very time-consuming.

Note

When exiting a program it is necessary to disable the Watchdog Timer, otherwise the system will reset.

Sample Program:

```
;
; INITIAL TIMER PERIOD COUNTER
W_LOOP:
    MOV    AX, 6F02H          ;setting the time-out value
    MOV    BL, 30             ;time-out value is 48 seconds
    INT    15H
;
; ADD YOUR APPLICATION PROGRAM HERE
    CMP    EXIT_AP, 1         ;is your application over?
    JNE    W_LOOP             ;No, restart your application
    MOV    AX, 6F02H          ;disable Watchdog Timer
    MOV    BL, 0              ;
    INT    15H
;
; EXIT
```

Index