

Hunter Industrial

***Pentium Processor™
Motherboard
Installation Guide***

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Introduction

Thank you for your purchase of the Hunter Industrial system board. The Hunter Industrial system board design was based on the Intel Triton™ chipset providing the ideal platform for getting the most power of the Intel Pentium™ processor. With proper installation and maintenance, your Hunter Industrial will provide years of high performance and trouble free operation.

This manual provides a detailed explanation into the installation and use of the Hunter Industrial system board. This manual is written for the novice PC user/installer. However, as with any major computer component installation, previous experience is helpful and should you not have prior experience, it would be prudent to have someone assist you in the installation. This manual is broken down into 3 chapters and 4 appendix.

Chapter 1 - System Board Pre-Configuration

This chapter provides all the necessary information for installing the Hunter Industrial. Topics discussed include: Installing the CPU (if necessary), DRAM installation, jumper settings for CPU, cache and standard I/O. Connecting all the cables from the system board to the chassis and peripherals.

Chapter 2 - BIOS Configuration

This chapter discusses the final step in getting your system up and running - running the BIOS SETUP program.

Chapter 3 - Upgrading

The Hunter Industrial provides a number of expansion options including memory and cache. All aspects of the upgrade possibilities are covered.

Appendix A - Technical Specifications

A complete listing of all the major technical specifications of the Hunter Industrial is provided.

Appendix B - Flash BIOS Programming

Provides all the information necessary to program your optional AMIBIOS Flash BIOS.

Appendix C - Troubleshooting

This Chapter lists the solutions for the most common questions on the Hunter Industrial operation.

Appendix D - Glossary Of Terms

Static Electricity Warning!

The Hunter Industrial has been designed as rugged as possible but can still be damaged if jarred sharply or struck. Handle the motherboard with care. The Hunter Industrial also contains delicate electronic circuits that can be damaged or weakened by static electricity. Before removing the Hunter Industrial from its protective packaging, it is strongly recommended that you use a grounding wrist strap. The grounding strap will safely discharge any static electricity built up in your body and will avoid damaging the motherboard. Do not walk across a carpet or linoleum floor with the bare board in hand.

Hunter Industrial - An Overview

The Hunter Industrial represents the ultimate in system board technology. No other system board available today provides such impressive list of features:

CPU Support

Intel P54C Pentium™ Processor

AMD K5 Pentium™ Processor

CPU Clock Speeds

75, 90, 100, 120, 133, 150, 166 and 200MHz.

Supported Bus Clocks

50, 60 and 66 MHz.

Memory

32 or 36-bit JEDEC standard FPM or EDO SIMMS - 70ns minimum access speed Memory capacity: 1 to 128MB.

High Speed DRAM Cache

256K of write-back direct-mapped asynchronous cache.

ROM BIOS

AMI© WinBIOS™ BIOS with optional FLASH ROM for easy field upgrades.

On-Board I/O

- Up to 4 enhanced IDE drives: two PCI IDE controllers
- 2 Floppies up to 2.88 Mb
- Two high speed RS-232 serial ports 16Byte FIFO (16550)
- One Centronics™ compatible bidirectional parallel port EPP/ECP mode compatible
- PS/2 mouse port

Conventions Used in this Manual

When instructed to enter keyboard keystrokes, the text will be noted by:

Enter Keystroke

Information displayed on the screen other than figure is displayed as:

Enter Password

Information presented in a text box denotes special interest. There are two types:



Important Information - such as static warnings, or very important instructions



Notes - Such as a brief discussion of memory types.

Chapter 1 Pre-Configuration

This chapter provides all the necessary information for installing the Hunter Industrial into a standard PC chassis. The topics discussed are: installing the CPU (if necessary), DRAM installation, jumper settings for CPU, cache and standard I/O.

Handling Precautions

The Hunter Industrial has been designed to be as rugged as possible but it can be damaged if dropped, jarred sharply or struck. Damage may also occur by using excessive force in performing certain installation procedures such as forcing the system board into the chassis or placing too much torque on a mounting screw.

Take special care when installing or removing the system memory SIMMs. Never force a SIMM into a socket. Screwdrivers slipping off a screw and scraping the board can break a trace or component leads, rendering the board unusable. Always handle the Hunter Industrial with care.



Special Warranty Note:

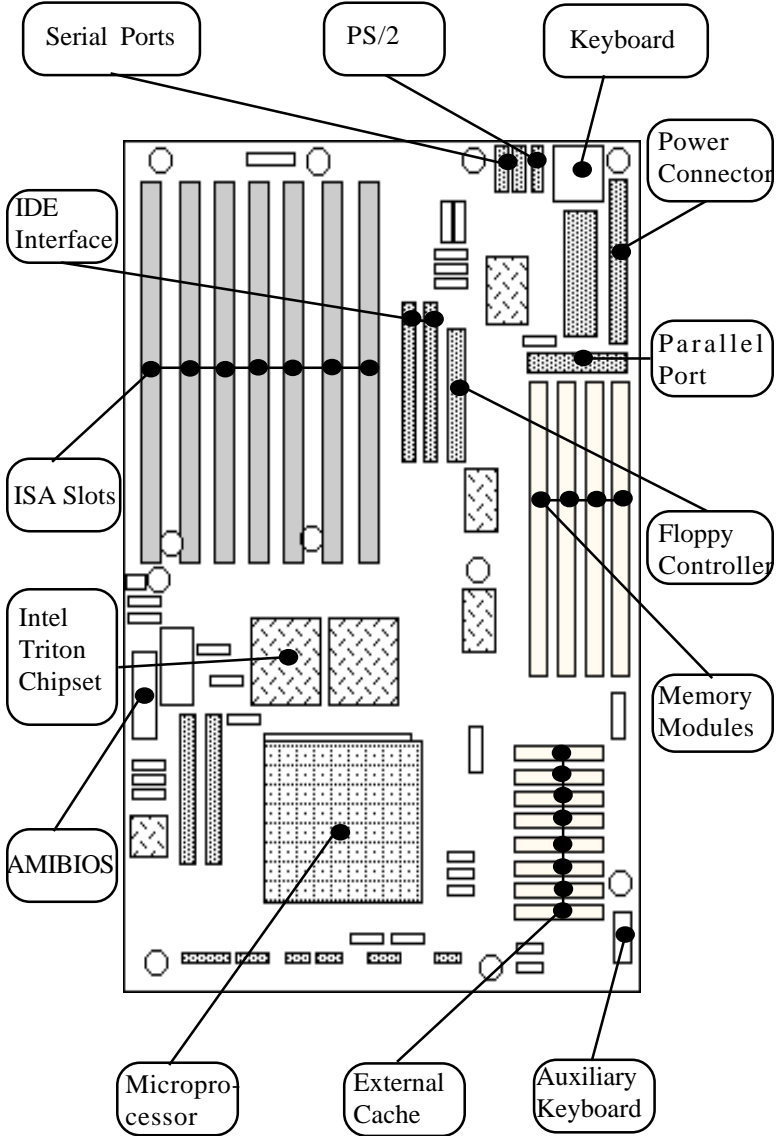
Products returned for warranty repair will be inspected for damaged caused by improper installation and misuse as described in the previous section and the static warning below. Should the board show signs of abuse, the warranty will become void and the customer will be billed for all repairs and shipping and handling costs.

Static Warning

The Hunter Industrial contains delicate electronic semiconductors that are highly sensitive to static electricity. These components, if subjected to a static electricity discharge, can be weakened thereby reducing the serviceable life of the system board. **BEFORE THE BOARD IS REMOVED FROM ITS PROTECTIVE ANTISTATIC PACKAGING TAKE PROPER PRECAUTIONS!** Work on a conductive surface that is connected to ground. Before touching any electronic device, ground yourself by touching an unpainted metal object or, and highly recommended, use a grounding strap.

Figure 1-1 Hunter Industrial System Board

Step 1 - Setting the Jumpers



Your Hunter Industrial is equipped with a large number of peripherals and has the ability to run at a variety of speeds without the need to change any crystals or oscillators. As such, there is a large number of configuration jumpers on the board. Taken step by step, setting these jumpers is easy. We suggest you review each section and follow the instructions.

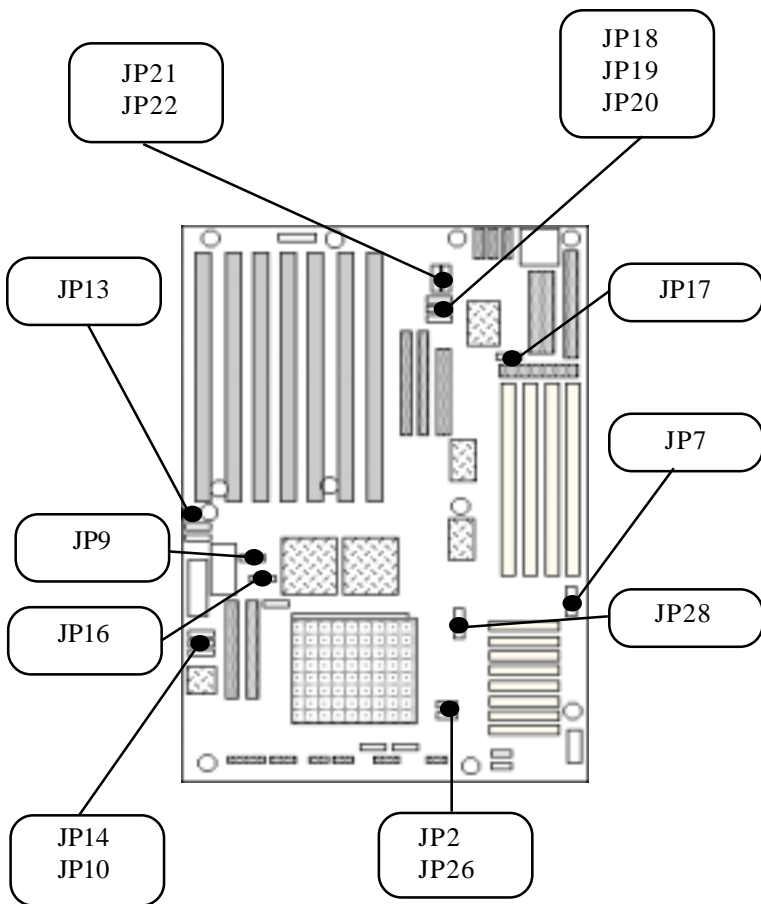
Jumper Types

Jumpers are small copper pins attached to the system board. Covering two pins with a shunt closes the connection between them. The Hunter Industrial examines these jumpers to determine specific configuration information. There are three different categories of jumpers on the Hunter Industrial.

- A. Two pin jumpers are used for binary selections such as enable, disable. Instructions for this type of jumper are open, for no shunt over the pins or closed, when the shunt covers the pins.
- B. Three or four pin jumpers are used for multiple selection. Instructions for these jumpers will indicate which two pins to cover. For example: for JPx2-3 the shunt will be covering pins 2 and 3 leaving pins 1 and 4 exposed.
- C. Grouped Jumpers are used when a certain function has multiple selections. There are two grouped jumpers on the board and careful attention should be given when setting these jumpers. Instructions for grouped jumpers are similar to those above - Jumper Location and Pin Numbers.

Jumper Locations

Use the diagram below and the tables on the following pages to locate and set the on-board configuration jumpers.



Standard I/O Enable

The Hunter Industrial standard I/O consists of the two serial ports, the parallel port and floppy disk controller. Jumper JP17 is used to enable or disable these ports.

Table 1-1 Standard I/O Enable

I/O	Enable	Disable
JP17	1-2*	2-3

Mouse IRQ Enable

The PS/2 type mouse port on your Hunter Industrial uses IRQ 12 as its interrupt request line. To enable the interrupt (default) leave Jumper JP10 on pins 2-3. To disable the interrupt and subsequently the mouse controller, move the jumper to pins 1-2.

Table 1-2 Mouse IRQ Enable

IRQ12	Disable	Enable
JP10	1-2	2-3*

CMOS Reset

This option is provided as a convenience for those who need to reset the CMOS registers. It should always be set to “Normal” for standard operation. If the CMOS needs to be reset turn off the system, move JP9 to 2-3, turn the system on, move JP9 back to 1-2 and reset the motherboard.

Table 1-3 CMOS Reset

RTC	Normal	Reset
JP9	1-2	2-3*

I/O Port IRQ Selection

The parallel port and both serial ports must have their IRQs. Normally, these settings can be left in their default settings and only when conflicts arise should they be changed. Jumper JP20 is used to select the parallel port IRQ. Jumper JP19 is used to select the first serial port's IRQ. Jumper JP18 is used to select the second serial port's IRQ. Use Table 1-8 to select the IRQs for these options.

Table 1-4 I/O Port IRQ Selection

Port	Jumper	1-2	2-3	Open
Parallel Port	JP20	IRQ 7*	IRQ 5	Disable
First Serial Port	JP19	IRQ 4*	IRQ 5	Disable
Second Serial Port	JP18	IRQ 3*	IRQ 9	Disable

IDE Drives Selection

The Hunter Industrial supports up to 4 IDE drives:

- 2 IDE drives on the primary PCI IDE controller
- 2 IDE drives on the secondary PCI IDE controller

The IDE interfaces can be configured in the BIOS.

Clock Speed Selection

The jumpers JP2, JP7 and JP 26 allow you to choose the appropriate CPU speed, without changing crystals and oscillators.

Table 1-5 Clock Frequency

Clock Frequency	JP7
50MHz	1-2
60MHz	3-4
66MHz	5-6*

Table 1-6 Clock Speed Selection

50 MHz	60MHz	66Mhz	JP2	JP26	Multiplier
75	90	100	1-2	1-2	1.5x
100	120	133	2-3	1-2	2.0x
150	180	200	1-2	2-3	3.0x
N/A	150	166	2-3	2-3	2.5x

Table 1-7 DMA Configuration for ECP Parallel Port

Port	Jumper	1-2*	3-4	5-6	7-8
ECP DMA	JP21	Disabled	DMA 3	DMA 5	DMA 6
	JP22	Disabled	DMA 3	DMA 5	DMA 6

Always move Both jumpers (JP21 and JP22) together.

Display Selection

Select the type of display trough JP14, 1-2 for color and 2-3 for monochrome.

Table 1-8 Display Selection

Display	1-2	2-3
JP14	Mono	Color*

Cache Size

The jumper JP28 allows you to choose the cache size desired.

Table 1-9 Cache Size Selection

Cache Size	256K	512K
JP28	1-2*	2-3

Flash BIOS

The jumper JP13 allows you to choose the Flash BIOS setup.

Table 1-10 Flash BIOS Selection

Flash BIOS	Intel	5V Flash
JP13	1-2*	2-3

Step 2 - DRAM, CPU and Cables Installation

Depending upon how your Hunter Industrial is configured you may need to install the following:

- DRAM(SIMMs)
- CPU

Hunter Triton Configuration

The Hunter Industrial uses standard or EDO 70ns access speed or faster SIMMs. It is very important that the quality of the SIMMs is good. Undesirable operation of the system may result if poor quality SIMMs are used. Always purchase your memory from a reliable source.



The Hunter Industrial uses standard 32 or 36-Bit SIMMs. They are slight larger than other 9-Bit SIMMs that are also commonly used on systems boards. They are configured into four, 8-Bit (or 1 Byte) sections. Thus, a total of 32 Bits (no parity) or 36 Bits (with parity) are stored. This is often confusing because these SIMMs are commonly referred to as 256K by 32 or 36 or 1MB by 32 or 36. To determine the actual capacity of the SIMM, simply multiply the 256K, 512K or 1MB by 4. Thus the actual SIMMS capacity is 1MB, 2MB and 4MB respectively.

Installing Memory Modules

The Hunter Industrial has 4 memory module sockets. The order in which they should be populated is from the inside of the board outward. Note that each socket is labeled: SM1, SM2, SM3, SM4. Refer to figure 1.3.

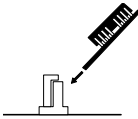


At least TWO memory modules MUST be installed at a time.

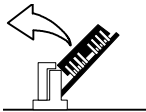
When inserting the memory modules, note the notch on the edge of each module. This notch is designed to permit insertion in only one way. This notch must be pointed towards the keyboard connector.

Start with the innermost socket (SM1). Gently place the module into the desired socket at a 30-45° angle. Then gently rotate or rock the module into an upright position. **Never force a memory module into its socket.** Rather, double check the notch and gently rock it into place. When the module has been properly installed, the metal latches on either side of the memory module will “click” into place. (See figure 1-2). Repeat the mentioned steps until all memory modules are installed. No jumpers are involved in DRAM configuration.

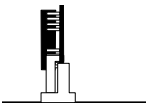
Figure 1-2 SIMM Insertion



Gently place the SIMM into the desired socket at 30°-45° angle.

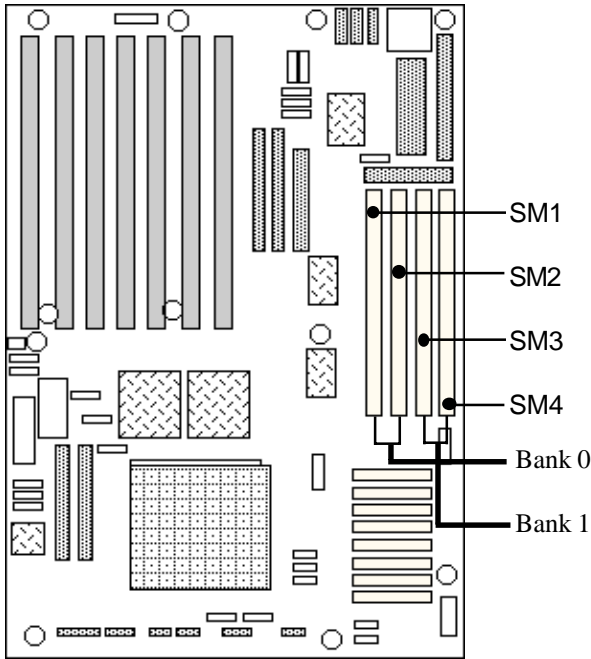


Then gently rotate or rock the SIMM into an upright position. **Never force a SIMM into its socket.**



Double check the notch and gently rock it into place if properly installed the SIMM will "click".

Figure 1-3 Memory Modules Socket Locations



CPU Installation

The Hunter Industrial currently supports the following CPUs:

- Intel P54C Pentium 75, 90, 100, 120, 150, 166 and 200MHz.
- AMD K5 75, 90, 100 and 133MHz.



1. *Improper installation of the CPU may cause permanent damage to both the system board and the CPU. -- Void of warranty*

2. *Always handle the CPU by the edges, never touch the pins.*

3. *Always use a heatsink and CPU fan.*

Using Figure 1-4, locate the diagonal notch on the CPU chip. This notch represents pin one. The Pentium processor also has small dot as well indicating pin 1. **DO NOT USE THE CHIP LOGO OR LETTERING TO LOCATE PIN ONE.**

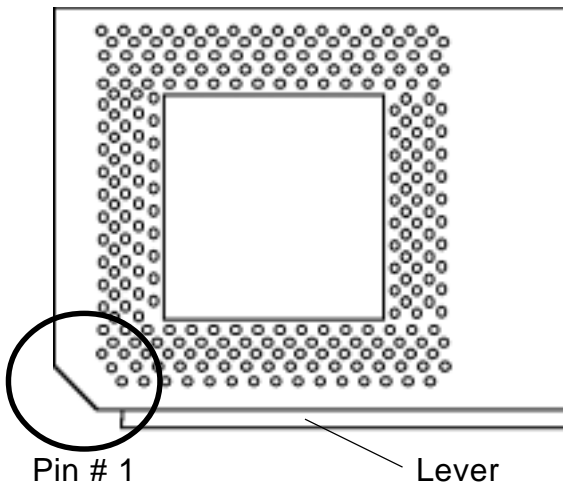
Locate the CPU socket on your Hunter Industrial system board. Pin 1 on the socket is located in the lower left hand corner of the socket.

Figure 1-4 CPU Alignment



To install the Pentium processor lift the lever of the ZIF socket and gently insert the CPU. Make sure the CPU is inserted all the way. Lower the lever. See figure 1-5.

Figure 1-5 CPU Socket alignment

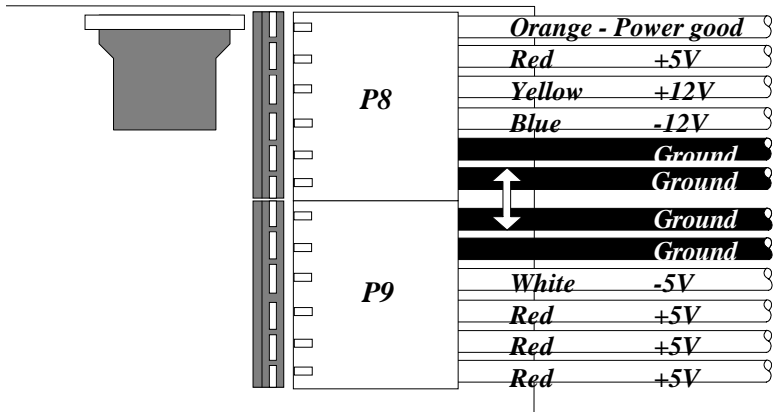


This completes the installation of the CPU. Now is a good time to double check both the CPU and SIMM installation to make sure that these devices have been properly installed.

Installing Cables

Power and Control Panel Cables

Figure 1-6 Power and Control Panel Cables



Connect the power supply cables to the system board. There is no formal convention for color coding the wires on power supplies except for ground wires which are black. Use figure above to determine the proper cable locations.

Next install the control panel cables for each of the control panel headers. These headers are located along the bottom of the board. Again, there is no standard convention for color coding these cables. However, the connectors for “Key lock/Power LED” and “Speaker” are keyed. While the actual connector on the cable harness may not be keyed, there will probably be a wire missing.

Figure 1-7 On-Board Connectors Location

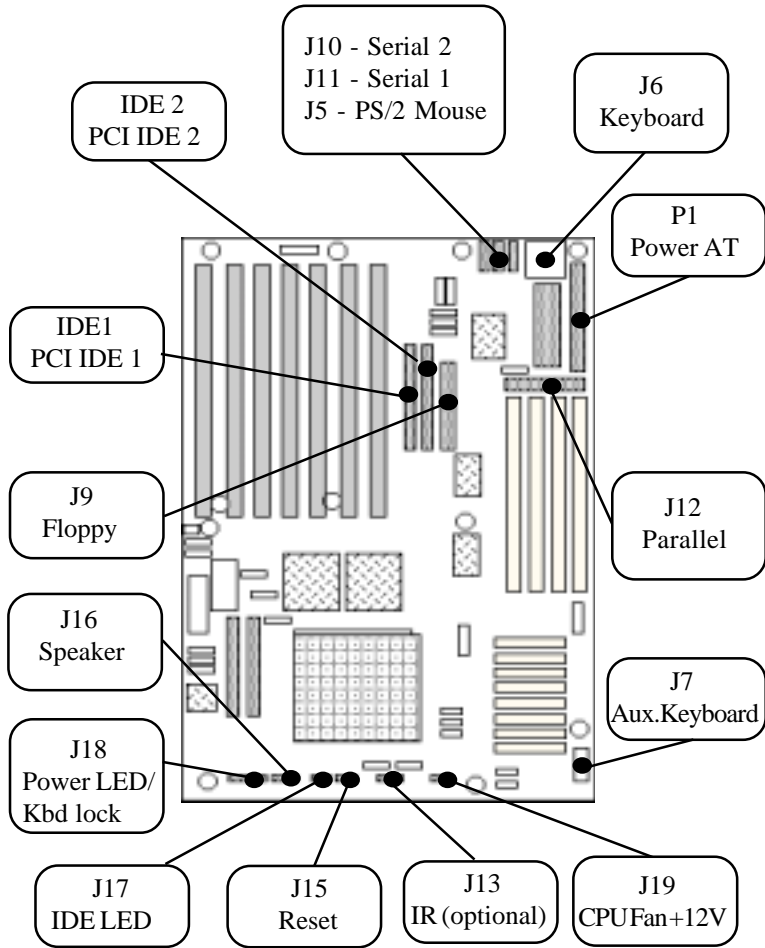


Table 1-11 Control Panel Connectors

Connector	Description
J5	PS/2 mouse
J6	Keyboard
J7	Aux. Keyboard
J9	Floppy
J10	Serial 2
J11	Serial 1
J12	Parallel
J13	Infra Red Interface
J15	Reset
J16	Speaker 1-SPK/2-key/3-GND/4-VCC
J17	IDE LED 1-positive/2-signal
J18	1-LED/2-key/3-GND/ 4&5-keylock
J19	CPU Fan 1&3-GND/2-12V
P1	AT Power
IDE 1	PCI IDE
IDE 2	PCI IDE

Installing Peripheral Cables

Begin with the top of the Hunter Industrial system working left to right. Refer Figure 1-1 for the locations of each of the peripheral connectors.

Now it is a good time to install the internal peripherals such as floppy and hard disk drives. Do not connect the power cable to these peripherals as it is easier to attach the bulky ribbon cables before the smaller power connectors. If you are installing more than one IDE drive double check your master/slave jumpers on the drives. Review the information supplied with your drive for more information on this subject.

Connect the floppy cable (not included) to the system board. Then connect remaining ends of the ribbon cable to the appropriate peripherals.

Finally, connect the IDE cable (not included) to the system. Then connect remaining ends of the ribbon cable to the appropriate peripherals. This concludes the hardware installation of your Hunter Industrial system. Now it is a good time to re-check all of the cable connections to make sure they are correct. It is also a good idea to label each of the external peripheral connectors - COM1, COM2, Mouse and Parallel.

User's Notes:

Chapter 2

WinBIOS Setup

Your Hunter Industrial features an AMI BIOS with available a new type of system BIOS Setup utility. WinBIOS Setup has a graphical user interface that permits mouse access, and is so compact that it can reside on the same ROM as the system BIOS. The system configuration parameters are set via WinBIOS Setup. Since WinBIOS Setup resides in the ROM BIOS, it is available each time the computer is turned on.

Starting WinBIOS Setup

As POST executes, the following appears:

Hit if you want to run SETUP

Using a Mouse with WinBIOS Setup

WinBIOS Setup has a built-in mouse driver and can be accessed by either a serial or PS/2-type mouse.

Using the Keyboard with WinBIOS Setup

WinBIOS Setup has a built-in keyboard driver that uses simple keystroke combinations:

Keystroke Function

<Tab>	Move to the next window or field.
, , ,	Move to the next field to the right, left, above, or below.
<Enter>	Select in the current field.
+	Increments a value.
-	Decrements a value.
<Esc>	Closes the current operation and return to previous level.
<PgUp>	Returns to the previous page.
<PgDn>	Advances to the next page.
<Home>	Returns to the beginning of the text.
<End>	Advances to the end of the text.
<Alt> <H>	Access a help window.
<Alt> <Spacebar>	Exit WINBIOS Setup.
Alphabetic keys	A to Z are used in the Virtual Keyboard, and are not case-sensitive.
Numeric keys	0 to 9 are used in the Virtual Keyboard and Numeric Keypad.

WinBIOS Setup Main Menu

The WinBIOS Setup main menu is organized into four windows. Each window corresponds to a section in this chapter.

Each section contains several icons. Clicking on each icon activates a specific function. The WinBIOS Setup icons and functions are described in this chapter. Some options may not be available in your BIOS. The sections are:

- | | |
|------------|---|
| Setup: | Described in Section 1. This section has five icons that permit you to set system configurations: standard setup, advanced setup, chipset setup, power management setup and peripheral setup. |
| Utilities: | Described in Section 2. This section has two icons that perform system functions. |
| Security: | Described in Section 3. This section has three icons that control WinBIOS security features. |
| Default: | Described in Section 4. This section has three icons that permit you to select a group of settings for all WinBIOS Setup options. |

Default Settings

- | | |
|------------|---|
| Original: | Returns settings to previous settings. |
| Optimal: | These settings provide the best performance characteristics. |
| Fail-Safe: | These settings are more likely to configure a workable computer when something is wrong. If you cannot boot the computer successfully, select the <i>Fail-Safe WinBIOS Setup</i> options and try to diagnose the problem after the computer boots. These settings do not provide optimal performance. |

Section 1 Setup

WINBIOS Setup can have up to six separate screens. Different types of system configuration parameters are set on each screen.

Standard Setup

Standard Setup options are displayed by choosing the Standard icon from the WINBIOS Setup menu. All Standard Setup options are described below.

Date/Time

Select the Date/Time option to change the date or time. The current date and time are displayed. Enter new values through the displayed window.

Floppy Drive A, B

Choose the Floppy Drive A or B icon to specify the floppy drive type. The settings are *360 KB 5¼"*, *1.2 MB 5¼"*, *720 KB 3½"*, *1.44 MB 3½"*, or *2.88 MB 3½"*.

Pri Master Pri Slave

Sec Master Sec Slave

Choose these icons to configure the hard disk drive named in the option. When you click on an icon, the following parameters are listed: Type, LBA/Large Mode, Block Mode, 32Bit Mode, and PIO Mode. All parameters relate to IDE drives except **Type**.

Configuring an MFM Drive

If configuring an old MFM hard disk drive, you must know the drive parameters (number of heads, number of cylinders, number of sectors, the starting write precompensation cylinder, and drive capacity). Choose **Type** and choose the appropriate hard disk drive type (1 - 46). If the drive parameters of your MFM drive do not match any drive type listed, select *User* in the **Type** field and enter the drive parameters on the screen that appears.

User-Defined Drive

If you are configuring a SCSI drive or an MFM, RLL, ARLL, or ESDI drive with drive parameters that do not match drive types 1-46, you can select the *User* in the **Type** field. You must then enter the drive parameters on the screen that appears. The drive parameters include:

- Cylinder (number of cylinders),
- Hd (number of heads),
- WP (starting write precompensation cylinder),
- Sec (number of sectors),
- Size (drive capacity).

Configuring IDE Drives

If the hard disk drive to be configured is an IDE drive, select the appropriate drive icon (Pri Master, Pri Slave, Sec Master, or Sec Slave). Select the IDE Detect icon to automatically detect all drive parameters.

The BIOS automatically detects the IDE drive parameters (including ATAPI CD-ROM drives) and displays them. Click on the OK button to accept these parameters Or you can set the parameters manually if you are absolutely certain that you know the correct IDE drive parameters.

- Click on **LBA/Large Mode** and choose *On* to enable support for IDE drives with capacities greater than 528 MB.
- Click on **Block Mode** and choose *On* to support IDE drives that use Block Mode.
- Click on **32Bit Mode** and click on *On* to support IDE drives that permit 32-bit accesses.
- Click on **PIO Mode** to select the IDE Programmed I/O mode. PIO programming also works with ATAPI CD-ROM drives. The settings are *Auto*, *0*, *1*, *2*, *3*, *4*, or *5*. Click on *Auto* to allow the BIOS to automatically find the PIO mode that the IDE drive being configured uses. If you select *0-5* you must make absolutely certain that you are selecting the PIO mode supported by the IDE drive being configured.

Configuring a CD-ROM Drive

Select the appropriate drive icon (Pri Master, Pri Slave, Sec Master, or Sec Slave). Choose the **Type** parameter and select CDROM. You can boot the computer from a CD-ROM drive. You can also choose *Auto* and let the BIOS automatically set the correct drive parameters.

Advanced Setup

Advanced Setup options are displayed by choosing the Advanced icon from the WINBIOS Setup main menu. All Advanced Setup options are described in this section.

Quick Boot

Set this option to *Enabled* to instruct the BIOS to boot quickly when the computer is powered on. This option replaces the old **Above 1 MB Memory Test** Advanced Setup option. The settings are: enabled and disabled.

The Optimal and Fail-Safe default settings are *Enabled*.

BootUp Sequence

This option sets the sequence of boot drives (floppy drive A:, hard disk drive C:, or a CD-ROM drive) that the BIOS attempts to boot from after AMIBIOS POST completes. The settings are *C:,A:,CDROM*, *CDROM,A:,C:*, or *A:,C:,CDROM*.

The default settings are *C:,A:,CDROM*.

BootUp NumLock

Set this option to *Off* to turn the Num Lock key off when the computer is booted so you can use the arrow keys on both the numeric keypad and the keyboard. The settings are *On* or *Off*. The default settings are *On*.

Floppy Drive Swap

Set this option to *Enabled* to permit drives A: and B: to be swapped. The settings are *Enabled* or *Disabled*. The default settings are *Disabled*.

Floppy Drive Seek

Set this option to *Enabled* to specify that floppy drive A: will perform a Seek operation at system boot. The settings are *Disabled* or *Enabled*. The optimal and fail-safe default settings are *Disabled*.

Mouse Support

When this option is set to *Enabled*, the BIOS supports a PS/2-type mouse. The settings are *Enabled* or *Disabled*. The default settings are *Enabled*.

Typematic Rate

This option specifies the speed at which a keyboard keystroke is repeated. The settings are *Fast* or *Slow*. The Optimal and Fail-Safe default settings are *Fast*.

System Keyboard

This option specifies that a keyboard is attached to the computer. The settings are *Present* or *Absent*. The Optimal and Fail-Safe default settings are *Present*.

Primary Display

This option specifies the type of display monitor and adapter in the computer. The settings are *Mono*, *CGA40*, *CGA80*, *EGA/VGA*, or *Absent*. The Optimal and Fail-Safe default settings are *EGA/VGA*.

Password Check

This option enables password checking every time the computer is powered on or every time WINBIOS Setup is executed. If *Always* is chosen, a user password prompt appears every time the computer is turned on. If *Setup* is chosen, the password prompt appears if WINBIOS is executed.

The Optimal and Power-On defaults are *Setup*.

OS/2 Compatible Mode

Set this option to *Enabled* to permit the BIOS to run with IBM OS/2. The settings are *Enabled* or *Disabled*. The default settings are *Disabled*.

Wait For F1 if Error

The BIOS POST error messages are followed by:

Press <F1> to continue

If this option is set to *Disabled*, the BIOS does not wait for you to press the <F1> key after an error message. The settings are *Disabled* or *Enabled*. The Optimal and Fail-Safe default settings are *Enabled*.

Hit Del Message Display

Set this option to *Disabled* to prevent the message

Hit if you want to run Setup

from appearing on the first BIOS screen when the computer boots. The settings are *Disabled* or *Enabled*. The Optimal and Fail-Safe default settings are *Enabled*.

Internal Cache

This option specifies the caching algorithm used for L1 internal cache memory. The settings are: *Disabled* or *Write Back* (default).

External Cache

This option specifies the caching algorithm used for L2 secondary (external) cache memory. The settings are: *Disabled* or *Enabled* (default).

System BIOS Shadow Cacheable

When this option is set to *Enabled*, the contents of the F0000h system memory segment can be read from or written to L2 secondary cache memory. The contents of the F0000h memory segment are always copied from the BIOS ROM to system RAM for faster execution. The settings are *Enabled* or *Disabled*. The Optimal default setting is *Enabled*. The Fail-Safe default is *Disabled*.

C000,16K Shadow

C400,16K Shadow

C800,16K Shadow

CC00,16K Shadow

D000,16K Shadow

D400,16K Shadow

D800,16K Shadow

C000,16K Shadow

These options control the location of the contents of the 16KB of ROM beginning at the specified memory location. If no adaptor ROM is using the named ROM area, this area is made available to the local bus. The settings are: *Enabled*, *Disabled* and *Cached*. In the BIOS for the Intel Triton chipset, the E000h page is used as ROM during POST, but shadowing is disabled and the ROM CS# signal is disabled to make the E000h page available on the local bus.

Chipset Setup

Memory Hole

Use this option to specify an area in memory that cannot be addressed on the ISA bus. The settings are *Disabled*, *512-640K* or *15-16MB*. The default setting is *Disabled*.

DRAM Speed

Specify the RAS access speed of the SIMMs installed in the motherboard as system memory. The settings are *60ns* or *70 ns*. The default is *70ns*.

IRQ12/M Mouse Function

Set this option to *Enabled* to specify that IRQ12 will be used for the mouse. The settings are *Disabled* or *Enabled*. The Optimal and Fail-Safe default settings are *Enabled*.

8-Bit I/O Recovery Time (SYSCCLK)

This option specifies the length of the delay (in SYSCCLKs) inserted between consecutive 8-bit I/O operations. The settings are 1, 2, 3, 4, 5, 6, 7, or 8. The Optimal and Fail-Safe default settings are 1.

16-Bit I/O Recovery Time (SYSCCLK)

This option specifies the length of the delay (in SYSCCLKs) inserted between consecutive 16-bit I/O operations. The settings are 1, 2, 3, 4, 5, 6, 7, or 8. The Optimal and Fail-Safe default settings are 1.

Power Management Setup

Power Management Setup options are displayed by choosing the Power Mgmt icon from the WINBIOS Setup main menu. All Power Management Setup options are described in this section.

Power Management/APM

Set this option to *Enabled* to enable the power management and APM (Advanced Power Management) features. The BIOS uses the RTC Alarm function to wake the computer at a pre-specified time. The settings are *Enabled* or *Disabled* or *Instant On*. The default settings are *Disabled*.

Inst-On Timeout (Minute)

This option allow the stand by feature. Set the time from *Disabled* up to 15 minutes. The default setting is *Disabled*.

Green PC Monitor Power State

This option specifies the power management state that the Green PC-compliant video monitor enters after the specified period of display inactivity has expired. The settings are *Off*, *Standby*, or *Suspend*. The default setting is *Standby*.

Video Power Down Mode

This option specifies the power management state that the video subsystem enters after the specified period of display inactivity has expired. The settings are *Disabled*, *Standby*, or *Suspend*. The default settings are *Disabled*.

Hard Disk Power Down Mode

This option specifies the power management state that the hard disk drive enters after the specified period of display inactivity has expired. The settings are *Disabled*, *Standby*, or *Suspend*. The default settings are *Disabled*.

Hard Disk Timeout (Minute)

This option specifies the length of a period of hard disk inactivity. When this period expires, the hard disk drive enters the power-conserving mode specified in the **Hard Disk Power Down Mode** option described on the previous page. The settings are *Disabled*, *1 Min (minutes)*, and all one minute intervals up to and including *15 Min*. The default settings are *Disabled*.

Standby Timeout (Minute)

This option specifies the length of the period of system inactivity when the computer is in Full-On mode before the computer is placed in Standby mode. In Standby mode, some power use is curtailed. The settings are *Disabled*, *1 Min*, *2 Min*, and all one minute intervals up to and including *15 Min*. The default settings are *Disabled*.

Suspend Timeout (Minute)

This option specifies the length of the period of system inactivity when the computer is already in Standby mode before the computer is placed in Suspend mode. In Suspend mode, nearly all power use is curtailed. The settings are *Disabled*, *1 Min*, *2 Min*, and all one minute intervals up to and including *15 Min*. The default settings are *Disabled*.

Slow Clock Ratio

This option specifies the speed at which the system clock runs in power saving modes. The settings are expressed as a ratio between the normal clock speed and the power down clock speed. The settings are *1:1*, *1:2* (half as fast as normal), *1:4*, *1:8*, *1:16*, *1:32*, *1:64*, or *1:128*. The default setting is *1:8*.

Display Activity

This option specifies if the BIOS is to monitor activity on the display monitor for power conservation purposes. When this option is set to *Monitor* and there is no display activity for the length of time specified in the value in the **Full-On to Standby Timeout (Min)** option, the computer enters a power saving state. The settings are *Monitor* or *Ignore*. The default settings are *Ignore*.

IRQ 3 - Monitor

IRQ 4 - Monitor

IRQ 5 - Ignore

IRQ 7 - Monitor

IRQ 9 - Ignore

IRQ 10 - Ignore

IRQ 11 - Ignore

IRQ 12 - Monitor

IRQ 13 - Ignore

IRQ 14 - Monitor

IRQ 15 - Monitor

These options enable event monitoring. When the computer is in a power saving mode, activity on the named interrupt request line is monitored by the BIOS. When any activity occurs, the computer enters Full On mode.

Each of these options can be set to *Monitor* or *Ignore*. The default setting for all options are as above indicated.

PCI/PnP Setup

PCI/PnP Setup options are displayed by choosing the PCI/PnP Setup icon from the WINBIOS Setup main menu. All PCI/PnP Setup options are described in this section

Plug and Play Aware OS

Set this option to *Yes* if the operating system installed in the computer is Plug and Play-aware. The BIOS only detects and enables PnP ISA adapter cards that are required for system boot. The Windows 95 operating system detects and enables all other PnP-aware adapter cards. Windows 95 is PnP-aware. Set this option to *No* if the operating system (such as DOS, OS/2, Windows 3.x) does not use PnP. *You must set this option correctly or PnP-aware adapter cards installed in your computer will not be configured properly.* The settings are *No* or *Yes*. The Optimal and Fail-Safe default settings are *No*.

PCI Burst Mode

Set this option to *Enabled* to enable PCI burst mode. The settings are *Disabled* or *Enabled*. The Optimal default setting is *Enabled*. The Fail-Safe default setting is *Disabled*.

PCI Concurrency

PCI Latency Timer (in PCI Clocks)

This option sets latency of all PCI devices on the PCI bus. The settings are in units equal to PCI clocks. The settings are 32, 64, 96, 128, 160, 192, 224, or 248. The Optimal and Fail-Safe default settings are 64.

PCI Streaming

PCI VGA Palette Snoop

This option must be set to *Enabled* if any ISA adapter card installed in the computer requires VGA palette snooping. The settings are *Disabled* or *Enabled*. The Optimal and Fail-Safe default settings are *Disabled*.

PCI IDE Bus Master

Set this option to *Enabled* to specify that the IDE controller on the PCI local bus has bus mastering capability. The settings are *Disabled* or *Enabled*. The Optimal and Fail-Safe default settings are *Disabled*.

Offboard PCI IDE Card

This option specifies if an offboard PCI IDE controller adapter card is used in the computer. You must also specify the PCI expansion slot on the motherboard where the offboard PCI IDE controller card is installed. If an offboard PCI IDE controller is used, the onboard IDE controller on the motherboard is automatically disabled. The settings are *Erase*, *Auto*, *Slot1*, *Slot2*, *Slot3*, or *Slot4*.

If *Auto* is selected, AMIBIOS automatically determines the correct setting for this option. The Optimal and Fail-Safe default settings are *Auto*.

In the AMIBIOS for the Intel Triton chipset, this option forces IRQ 14 and 15 to a PCI slot on the PCI local bus. This is necessary to support non-compliant PCI IDE adapter cards.

Offboard PCI IDE Primary IRQ

This option specifies the PCI interrupt used by the primary IDE channel on the offboard PCI IDE controller. The settings are *Disabled*, *INTA*, *INTB*, *INTC*, *INTD*, or *Hardwired*. The Optimal and Fail-Safe default settings are *Disabled*.

Offboard PCI IDE Secondary IRQ

This option specifies the PCI interrupt used by the secondary IDE channel on the offboard PCI IDE controller. The settings are *Disabled*, *INTA*, *INTB*, *INTC*, *INTD* or *Hardwired*. The Optimal and Fail-Safe default settings are *Disabled*.

IRQ3

IRQ4

IRQ5

IRQ7

IRQ9

IRQ10

IRQ11

IRQ12

IRQ14

IRQ15

These options specify the bus that the named interrupt request lines (IRQs) are used on. These options allow you to specify IRQs for use by legacy ISA adapter cards.

These options determine if the BIOS should remove an IRQ from the pool of available IRQs passed to BIOS configurable devices. The available IRQ pool is determined by reading the ESCD NVRAM (Flash BIOS ROM only). If more IRQs must be removed from the pool, the end user can use these PCI/PnP Setup options to remove the IRQ by assigning the option to the *ISA/EISA* setting. Onboard I/O is configurable by AMIBIOS. The IRQs used by onboard I/O are configured as *PCI/PnP*.

The settings are *PCI/PnP* or *ISA/EISA*. The Optimal and Fail-Safe default settings are *ISA/EISA* and IRQ14 and IRQ 15 *PCI/PnP*.

Reserved Memory Size

This option specifies the size of the memory area reserved for legacy ISA adapter cards.

The settings are *Disabled*, *16K*, *32K*, or *64K*. The Optimal and Fail-Safe default settings are *Disabled*.

Reserved Memory Address

This option specifies the beginning address (in hex) of the reserved memory area. The specified ROM memory area is reserved for use by legacy ISA adapter cards.

The settings are *C0000*, *C4000*, *C8000*, *CC000*, *D0000*, *D4000*, *D8000*, or *DC000*. The Optimal and Fail-Safe default settings are *C0000*.

Peripheral Setup

Peripheral Setup options are displayed by choosing the Peripheral Setup icon from the WINBIOS Setup main menu. All Peripheral Setup options are described in this section.

Onboard FDC

This option enables the floppy drive controller on the motherboard. The settings are *Enabled*, *Disabled* or *Auto*. The Optimal default setting is *Auto*. The Fail-Safe default setting is *Auto*.

Onboard Serial Port1

This option enables serial port 1 on the motherboard and specifies the base I/O port address for serial port 1.

The settings are *Auto*, *3F8h*, *2F8*, *3E8*, *2E8* or *Disabled*. The Optimal and Fail-Safe default settings are *Auto*.

Onboard Serial Port2

This option enables serial port 2 on the motherboard and specifies the base I/O port address for serial port 2.

The settings are *Auto*, *3F8h*, *2F8*, *3E8*, *2E8* or *Disabled*. The Optimal and Fail-Safe default settings are *Auto*.

On-board Parallel Port

This option enables the parallel port on the motherboard and specifies the parallel port base I/O port address. The settings are *Auto*, *378h*, *278h*, *3BC*, or *Disabled*. The Optimal and Fail-Safe default setting are *Auto*.

Parallel Port Mode

This option specifies the parallel port mode. ECP and EPP are both bi-directional data transfer schemes that adhere to the IEEE P1284 specifications. The settings are: *Normal*, *Bi-Directional*, *EPP*, *ECP*.

Parallel Port DMA

This option is only available if the setting for the **Parallel Port Mode** option is *ECP*.

The settings are *Disabled*, *DMA CH (channel) 0*, *DMA CH 1*, or *DMA CH 3*. The default setting is *Disabled*.



Refer to Hardware Jumper settings on Chapter one for JP 21 and JP22 when setting for these options.

Onboard PCI IDE

This option specifies the onboard IDE controller channels that will be used. The settings are *Primary*, *Secondary*, *Both*, or *Disabled*. The Optimal and Fail-Safe default settings are *Primary*.

Section 2 Utility

The following icons appear in this section:

Detect IDE and
Language

Detect IDE

This option allows the detection of an IDE hard drive automatically.

Language

English support only.

Section 3 Security

AMIBIOS Password Support

Three icons appear in this part of the WINBIOS Setup screen:

Supervisor,
User,
Anti-Virus.

Two Levels of Passwords

Both the Supervisor and the User icons configure password support. If you use both, the Supervisor password must be set first. The system can be configured so that all users must enter a password every time the system boots or when WINBIOS Setup is executed, using either or both the Supervisor password or User password.

If You Do Not Want to Use a Password

Just press <Enter> when the password prompt appears.

Setting a Password

The password check option is enabled in Advanced Setup by choosing either *Always* (the password prompt appears every time the system is powered on) or *Setup* (the password prompt appears only when WINBIOS is run). The password is stored in CMOS RAM. The following screen appears when you select the password icon from the WINBIOS Setup main menu.

You can enter a password by:

Typing the password on the keyboard or
Selecting each letter via the mouse.

When you select Supervisor or User, the BIOS prompts for a password. You must set the Supervisor password before you can set the User password. Enter a 1 – 6 character password. The password does not appear on the screen when typed. Make sure you write it down. If you forget it, you must drain CMOS RAM and reconfigure the system.

Changing a Password

Select the appropriate password icon (Supervisor or User) from the Security section of the WINBIOS Setup main menu. Enter the password and press <Enter>. The screen does not display the characters entered. After the new password is entered, retype the new password as prompted and press <Enter>.

If the password confirmation is incorrect, an error message appears. If the new password is entered without error, press <Esc> to return to the WINBIOS Main Menu. The password is stored in CMOS RAM after WINBIOS completes. The next time the system boots, you are prompted for the password if the password function is present and is enabled.

Remember the Password

Keep a record of the new password when the password is changed. If you forget the password, you need to reset the CMOS memory (refer to JP 9 on jumper settings - chapter 1)

Anti-Virus

When this icon is selected from the Security section of the WINBIOS Setup main menu, the BIOS issues a warning when any program (or virus) issues a Disk Format command or attempts to write to the boot sector of the hard disk drive. The settings are *Enabled* or *Disabled*. If enabled, the following appears when a write is attempted to the boot sector. You may have to type *N* several times to prevent the boot sector write.

Boot Sector Write!!!

Possible VIRUS: Continue (Y/N)? _

The following appears after any attempt to format any cylinder, head, or sector of any hard disk drive via the BIOS INT 13 Hard Disk Drive Service:

Format!!!

Possible VIRUS: Continue (Y/N)? _

Section 4 Default

The icons in this section permit you to select a group of settings for all WINBIOS Setup options. Not only can you use these icons to quickly set system configuration parameters, you can choose a group of settings that have a better chance of working when the system is having configuration-related problems.

Original

Choose the Original icon to return to the system configuration values present in WINBIOS Setup when you first began this WINBIOS Setup session.

Optimal

You can load the optimal default settings for the WINBIOS by selecting the Optimal icon. The Optimal default settings are best-case values that should optimize system performance. If CMOS RAM is corrupted, the Optimal settings are loaded automatically.

Fail-Safe

You can load the Fail-Safe WINBIOS Setup option settings by selecting the Fail-Safe icon from the Default section of the WINBIOS Setup main menu.

The Fail-Safe settings provide far from optimal system performance, but are the most stable settings. Use this option as a diagnostic aid if the system is behaving erratically.

Chapter 3:

Upgrading

Upgrading the System Memory

The Hunter Industrial allows an upgrade of the system memory up to 128MB, using SIMMs memory modules. Please refer to chapter one for proper memory installation.

Upgrading the Microprocessor

The Hunter Industrial currently supports the following CPUs:

- Intel P54C Pentium 75, 90, 100, 120, 150, 166 and 200MHz.
- AMD K5 Pentium Processor 75, 90, 100 and 133MHz

To upgrade the Microprocessor, please refer to Chapter 1 for proper installation and jumper settings.

User's Notes:

Appendix A

Technical Specifications

Chip Sets

Core Logic

Intel Triton 430FX Chip-Set

Peripheral I/O

Chips & Technologies 735A or
Standard microsystems FDC37C665

Micro Processor Support

-Intel 3.3V Pentium processors 75, 90, 100, 120, 133, 150, 166,
and 200MHz
-AMD K5 Pentium processors 75, 90, 100, 120, 133, 166MHz

System Memory

Memory Capacity

1 to 128MB of FPM or EDO DRAM memory.

Memory Type

Four sockets for JEDEC compatible (72 pin) 32 bit SIMMs, 70ns access speed or faster. All memory configurations is automatic through BIOS.

Supports FPM and EDO memories.

36 bit SIMMS can be used, but parity is not supported

Cache Memory

Cache on board with 256K asynchronous cache SRAMS.

Bios

System BIOS

AMI WinBIOS with standard CMOS Setup, Peripheral Setup, Power Management, Automatic Hard Disk Detection and Advanced Chip-set Setup.

Flash BIOS

Optional feature for System BIOS. Flash programming done through BIOS

Embedded Interfaces

IDE

Two PCI EIDE controllers. Supports up to 4 devices

Floppy

Up to two floppy disk drives. Sizes supported are: 5.25" 360K and 1.2MB; 3.5" 720K, 1.44MB and 2.88MB. Floppy Tape and CDROM compatible. 34 pin header on-board.

Serial Ports

Two high speed 16550 compatible UARTS.
BIOS configurable as COM1 - 4.

Parallel Port

One Centronics compatible, bi-directional (PS/2 compatible).
Microsoft/HP EPC/EPP high speed.

Mouse Port

One PS/2 compatible mouse controller with 6 pin mini-din connector cable.

Expansion Slots

Seven 16 bit ISA slots.

Miscellaneous

CMOS/Battery

RTC with lithium battery. No external battery is required.

Control Panel Connections

Reset, Keylock, Speaker, CPU fan (12V). LEDs for power and IDE.

CPU Socket

Standard ZIF (Zero Insertion Force), socket 7.

Form Factor

Baby AT Size - 8.6" x 13"

PCB Construction

Four Layer, dry film mask.

Manufacturing Process

Automated surface mount.

Reliability

MTBF: Higher than 48.000 hours

Environmental	Operating	Non-Operating
Temperature	0 to +55	-40 to +65 C
Humidity	5 to 95% @ 40 C non-condensing	5 to 95% @ 40 C non-condensing
Shock	2.5G @ 10ms	10G 10ms
Vibration	0.25 @ 5-100Hz	5G @ 5-100Hz

Table A-1 Standard PC-AT I/O Map

Address (HEX)	Device
000-01F	DMA Controller
020-03F	Interrupt Controller 1
040-05F	Timer
070-07F	Real Time Clock (non-maskable interrupt)
080-09F	DMA Page Registers
0A0-0BF	Interrupt Controller 2
0C0-0DF	DMA Controller 2
0F8-0FF	Math co-processor
1F0-1FF	Hard Disk Controller
200-207	Game I/O
278-27F	Prototype Card
2F8-2FF	Serial Port 2
300-31F	Parallel Printer Port
380-38F	SDLC Bisynchronous 2
3B0-3AF	Bisynchronous 1
3B0-3BF	Monochrome Display/Printer
3C0-3CF	(Reserved)
3D0-3DF	Color Graphics Display Adapter
3F0-3F7	Floppy Disk
3F8-3FF	Serial Port COM1

Table A-2 DMA Page Register and I/O address

Channel	Function
Page Register	I/O Hex Address
Channel 0	87
Channel 1	83
Channel 2	81
Channel 3	82
Controller 2: 16-bit (at Only - ports 0C0-0DF)	
Channel 5	8B
Channel 6	89
Channel 7	8A
Refresh (AT)	8F

Table A-3 DMA Assignments

Channel	Function
0	Reserved
1	SDLC
2	Floppy Disk
3	Spare
4	Cascade for CTRL
5	Spare (Reserved)
6	Spare (Reserved)
7	Spare (Reserved)

Table A-4 DMA Controller Register

DMA #		Description
1	2	
0	0C0	CH0 base and current address
1	0C2	CH0 base and current word count
2	0C4	CH0 base and current address
3	0C6	CH0 base and current word count
4	0C8	CH0 base and current address
5	0CA	CH0 base and current word count
6	0CC	CH0 base and current address
7	0CE	CH0 base and current word count
8	0D0	Read status register/write command register
9	0D2	Write request register
00A	0D4	Write single mask request register bit
00B	0D6	Write mode register
00C	0D8	Clear byte pointer Flip/Flop
00D	0DA	Read temporary register / Write master clear
00E	0DC	Clear mask register
00F	0DE	Write all mask register bits

Table A-5 Interrupts

Channel	Name	Function
NMI	NMI	Parity
0	IRQ0	System Timer Output 0*
1	KYBIRQ	Keyboard Output Buffer Full
2	IRQ2	CTRL2 Interrupt (IRQ8-IRQ15)
3	IRQ3	Serial Port 2 (COM2)
4	IRQ4	Serial Port 1 (COM1)
5	IRQ5	Parallel Port 2
6	IRQ6	Floppy Disk Controller
7	IRQ7	Parallel Port 1
8	RTCIRQ	Real Time Clock
9	IRQ9	Available
10	IRQ10	Available
11	IRQ11	Available
12	IRQ12	PS/2 Mouse
13	IRQ13	Math Coprocessor
14	IRQ14	Primary IDE
15	IRQ15	Secondary IDE

Connectors Pin Outs

Table A-6 Serial Connectors

Pin#	Name
1	-DCD
2	-DSR
3	RXD
4	-RTS
5	TXD
6	-CTS
7	-DTR
8	-RI
9	GND
10	N/C

Table A-7 Floppy Disk Drive Connector

Pin#	Name
2	RMP/LC
4	N/C
6	IDO
8	-INDEX
10	-MTRO
12	-DRV1
14	-DRVO
16	-MTR1
18	DIR
20	-STEP
22	-WDATA
24	-WGATE
26	-TRK0
28	-WPRT
29	ID0
30	-RDATA
32	HDSEL
33	ID1
34	DSKCHG
*	GND

Table A-8 Parallel DB25 Connector

Pin#	Name
1	-STROBE
2	+DATA BIT 0
3	+DATA BIT 1
4	+DATA BIT 2
5	+DATA BIT 3
6	+DATA BIT 4
7	+DATA BIT 5
8	+DATA BIT 6
9	+DATA BIT 7
10	ACK1
11	BUSY
12	PAPER EMPTY
13	SLCT
14	AUTOFEED
15	ERROR
16	INIT
17	SLCT IN
18-25	GND

Table A-9 IDE Connector

Pin#	Name	Pin#	Name
1	-RST	21	N/C
2	GND	22	GND
3	D7	2	IOW
4	D8	3	GND
5	D6	24	IOR
6	D9	25	GND
7	D5	26	N/C
8	D10	27	BALE
9	D4	28	N/C
10	D11	29	GND
11	D3	30	IRQ14
12	D12	31	IO16
13	D2	32	SAI
14	D13	34	N/C
15	D1	35	SA0
16	D14	36	SA2
17	D0	37	CS0
18	D15	38	CS1
19	GNC	39	HDIND
20	N/C	40	N/C

Table A-10 PS/2 Mouse Connector

Pin#	Name
1	DATA
2	N/C
3	GND
4	+5V
5	CLOCK
6	N/C

Table A-11 Serial Port Cable Wire List

Pin#	Signal	Pin#	9 Pin
1	-DCD	8	1
2	-DSR	6	6
3	RXD	3	2
4	-RTS	4	7
5	TXD	2	3
6	-CTS	5	8
7	-DTR	20	4
8	-RI	22	9
9	GND	7	5
10	N/C	N/C	N/C

Table A-12 Parallel Port Connector

Pin#	Name	Pin#	Name
1	-STROBE	2	AUTOFEED
3	+DATA BIT 0	4	ERROR
5	+DATA BIT 1	6	INIT
7	+DATA BIT 2	8	SLCT IN
9	+DATA BIT 3	10	GND
11	+DATA BIT 4	12	GND
13	+DATA BIT 5	14	GND
15	+DATA BIT 6	16	GND
17	+DATA BIT 7	18	GND
19	ACK	20	GND
21	BUSY	22	GND
23	PAPER EMPTY	24	GND
25	SLCT	26	N/C

Table A-13 PCI Connector Pin Assignments

Pin#	Assign.	Pin#	Assign.	Pin#	Assign	Pin#	Assign.
A01	TRST#	A32	AD16	B01	-12V	B32	ad17
A02	+12V	A33	---	B02	TCK	B33	C/BE2#
A03	TMS	A34	FRAME#	B03	GND	B34	GND
A04	TDI	A35	GND	B04	TDO	B35	IRDY#
A05	+5V	A36	TRDY#	B05	+5V	B36	----
A05	INTA#	A37	GND	B06	+5V	B37	DEVSEL
A06	INTC#	A38	STOP#	B07	INTB#	B38	GND
A07	+5V	A39	----	B08	INTD#	B39	LOCK#
A08	CLKC	A40	SDONE	B09	REQ3#	B40	PERR#
A09	+5V	A41	SB0#	B10	REQ1#1	B41	----
A10	CLCKD	A42	GND	B11	GNT3#	B42	SERR#
A11	GND	A43	PAR	B12	GND	B43	----
A12	GND	A44	AD15	B13	GND	B44	C/BE1#
A13	GNT1#	A45	----	B14	CLKA	B45	AD14
A14	RST#	A46	AD13	B15	GND	B46	GND
A15	+5V (I/O)	A47	AD11	B16	CLKB	B47	AD12
A16	GNT0#	A48	GND	B17	GND	B48	AD10
A17	GND	A49	AD09	B18	REQ0#	B49	GND
A18	REQ2#	A50	KEY	B19	+5V(I/O)	B50	KEY
A19	AD30	A51	KEY	B20	AD31	B51	KEY
A20	----	A52	C/BE0#	B21	AD29	B52	AD08
A21	AD28	A53	----	B22	GND	B53	AD07
A22	AD26	A54	AD06	B23	AD27	B54	----
A23	GND	A55	AD04	B24	AD25	B55	AD05

Pin#	Assign.	Pin#	Assign.	Pin#	Assign	Pin#	Assign.
A26	----	A58	AD00	B27	AD23	B58	AD01
A27	AD22	A59	+5V (I/O)	B28	GND	B59	+5V (I/O)
A29	AD20	A60	REQ64#	B29	AD21	B60	ACK64#
A30	GND	A61	+5V	B30	AD19	B61	+5V
A31	AD18	A62	+5V	B31	----	B62	+5V

Table A-14 ISA Connector Pin Assignments

Pin#	Assign.	Pin#	Assign.	Pin#	Assign	Pin#	Assign.
A01	IOCHCH	B01	GND	C01	SBHE#	d01	EMCS1
A02	SD7	B02	RESETD	C02	LA23	D02	IOCS16
A03	SD6	B03	+5V	C03	LA22	D03	IRQ10
A04	SD5	B04	IRQ9	C04	LA21	D04	IRQ11
A05	SD4	B05	+5V	C05	LA20	D05	IRQ12
A05	SD3	B06	DRQ2	C06	LA19	D06	IRQ15
A06	SD2	B07	-12V	C07	LA18	D07	IRQ14
A07	SD1	B08	ENDXFR	C08	LA17	D08	DACK0
A08	SD0	B09	+12V	C09	MEMR	D09	DRQ0
A09	IOCHR	B10	GND	C10	MEMW#	D10	DACK5
A10	AEN	B11	SMEMW#	C11	SD8	D11	DRQ5
A11	SA19	B12	SMERW#	C12	SD9	D12	DACK6
A12	SA18	B13	IOW#	C13	SD10	D13	DRQ6
A13	SA17	B14	IOR#	C14	SD11	D14	DACK7
A14	SA16	B15	DACK3#	C15	SD12	D15	DRQ7
A15	SA15	B16	DRQ3	C16	SD13	D16	+5V
A16	SA14	B17	DACK1#	C17	SD14	D17	MASTE
A17	SA13	B18	DRQ1	C18	SD15	D18	GND
A18	SA12	B19	REFRES				
A19	SA11	B20	SYSCLK				
A20	SA10	B21	IRQ7				
A21	SA9	B22	IRQ6				
A22	SA8	B23	IRQ5				
A23	SA7	B24	IRQ4				

Pin#	Assign.	Pin#	Assign.	Pin#	Assign	Pin#	Assign.
A24	SA6	B25	DACK2#				
A25	SA5	B26	TC				
A26	SA4	B27	BALE				
A27	SA3	B28	+5V				
A29	SA2	B29	OSC				
A30	SA1	B30	GND				
A31	SA0	B31					

User's Notes:

Appendix B

Flash BIOS programming

If your board has the optional FLASH BIOS installed, you will be able to update your BIOS without having to replace the EPROM. The WinBios will read the new BIOS file from a floppy disk, replace the old BIOS and reboot your computer.

When updating your BIOS, make sure you have a disk with the correct BIOS file (it's size should be 128K).

Rename the file to "AMIBOOT.ROM". Turn your computer off. Insert the disk in Drive A.; turn the computer on while pressing <CTRL><HOME>. Your computer will show no screen, but will beep to indicate what is being done.

If the programming is successful, you should hear the 4 beeps and your computer will reboot with the new BIOS.

Please never turn the power off while reprogramming a FLASHBIOS. Refer to the table on the next page for beep errors.

Table B-1 Flash Bios Beep Errors

Beeps	Description
1	Insert diskette in floppy A:
2	The AMI BOOT.ROM file was not found in the root directory of floppy drive A
3	Base memory error
4	Flash program successfull
5	Floppy read error
6	Keyboard controller BAT command failed
7	No FLASH EPROM detected
8	Floppy controller failure
9	Boot Block BIOS checksum error
10	Flash erase error
11	Flash program error
12	AMIBOOT.ROM file size error

Appendix C Troubleshooting

Power-On Self Test

The BIOS featured in the Hunter Industrial provides all IBM standard Power-On Self Test (POST) routines as well as enhanced BIOS POST routines. The BIOS POST supports CPU internal diagnostics. The BIOS POST checkpoint codes are accessible via the manufacturing Test Port (I/O port 80h).

Post Phases:

Every time the system is powered on. The BIOS executes two types of POST routines:

System Test and Initialization (test and initialize BIOS for normal operations).

System Configuration Verification (compare defined configuration with hardware actually installed).

BIOS Error Reporting:

If the error occurs before the display device is initialized a series of beeps sound. Beep codes indicate that a fatal error has occurred. The BIOS beep codes are described on the next page.

If the error occurs after the display device is initialized the error message is displayed. A prompt to press <F1> can also appear power is on.

Fatal errors, which halt the boot process, are communicated through a series of audible beeps.

Table C-1 Beep Errors

Beeps	Error Message	Description
1	Refresh Failure	The memory refresh circuitry is faulty
2	Parity Error	Parity error in the base memory (the first 64 KB block) of memory
3	Base 64 KB Memory failure	Memory failure in the first 64 KB
4	Timer Not Operational	A memory failure in the first 64 KB of memory, or timer 1 is not functioning
5	Processor Error	The CPU generated an error
6	8042 - Gate A20 failure	Cannot switch to protect mode
7	Processor Exception Interrupt Error	The CPU on the CPU card generated an exception interrupt
8	Display Memory Read/Write Error	The system video adapter is either missing or its memory is faulty. This is not a fatal error.
9	ROM Checksum Error	The ROM checksum value does not match the value enclosed in AMIBIOS
10	CMOS Shutdown Register Read/Write Error	The shutdown register for CMOS RAM has failed
11	Cache Memory Bad -- Do not Enable Cache	The cache memory test failed. Cache memory is disabled. Do not press <ctrl><alt><shift><+> to enable cache memory

Appendix D Glossary of Terms

Bidirectional Parallel Port:

An eight-bit port that can be used for an input as well as an output device.

BIOS (Basic Input/Output Systems):

The on-board firmware which communicates with the display, keyboard, printers and other peripheral devices.

Bus:

One or more electrical conductors that transmit power or binary data to the various sections of a computer.

CMOS (Complementary Metal Oxide Semiconductor):

A technique of fabricating transistors which uses very low power.

CMOS RAM:

Random Access Memory made from CMOS transistors.

DMA (Direct Memory Access Channel):

A channel for transferring data from host main memory to and from peripherals without direct involvement of the CPU resources.

DRAM (Dynamic Random Access Memory):

The main memory in your computer. It needs to be refreshed by a memory or it will lose its information.

EPROM (Erasable Programmable Read Only Memory)

A programmable device which stores information regardless of power. The information can be erased and new information written.

Floating Point Unit (FPU):

A device which can perform calculations on numbers in floating point format as opposed to simple integers.

IDE (Integrated Drive Electronics):

A standard of signalling and communicating with a device.

Interleave

Multiple banks of memory that overlap to reduce the access time and eliminate wait states.

Interrupt:

Temporarily halting the operation of a digital computer to respond to service an external event.

Interval Timer:

A device that can generate a pulse at a defined interval for background tasks.

IRQ (Interrupt Request):

A signal channel used to trigger the CPU to temporarily change tasks

Kilobyte (KB):

1024 bytes

ns (nano seconds):

1×10^{-9} seconds. (There are one billion nanoseconds in one second)

Page Mode:

The ability to read a whole line (page) of memory to reduce access time

Parity:

A way to detect corrupted data in DRAM.

Parallel Port:

An eight-bit port usually used for connecting a printer.

PCI (Peripheral Component Interconnect):

Local bus for PCs provide a high-speed data path between the CPU and peripherals (video, disk, network, etc.). The PCI bus coexists in the PC with the ISA or EISA bus. ISA and EISA boards still plug into an ISA or EISA slot, while high- speed. PCI controllers plug into a PCI slot, The PCI bus runs at 25, 30 or 33MHz, supports 32-bit and 64-bit data paths and bus mastering. The first PCs with PCI buses became available toward the end of 1993.

Port:

Ports are used to connect peripheral devices such as external drives and printers to your computer.

RAM (Random Access Memory):

The memory used to execute applications while your computer is turned ON. When you tum your computer OFF, all data stored in RAM is lost.

Real-Time Clock (RTC):

A CMOS counter used to maintain local time.

Retaining Bracket:

The bracket on the end of the board that attaches to the back of the chassis and contains connectors, usually key board, mouse, serial port, and/or parallel port.

Serial Port:

A two channel port, one channel used for “In” transmis- sions and one for “Out” transmissions.

SCSI (Small Computer System Interface):

A high speed, general purpose interface to storage devices.

SRAM(Static Random Access Memory):

As opposed to DRAM, this memory does not need to be refreshed by a controller and holds its information as long as the power is on.

Tag Comparator:

A memory that tells whether an address is available in the cache.

Wait State:

Extra time inserted to allow access to slower devices (e.g. DRAM) or EPROMs.

Write-Back Cache:

The process where the CPU updates the cache and the DRAM simultaneously but does not wait for the DRAM to complete the update.

Write-Thru Cache:

The process where the CPU updates the cache and the DRAM simultaneously but the CPU waits for the DRAM to complete the update, resulting in more time being consumed than in write-back.

User's Notes

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