

MB-3792/3792G
Dual Pentium® III with
Dual 10/100Mb Ethernet , Gigabit Ethernet
VGA, Audio,
Dual ATA-100 Raid IDE Port
Ver 1.x

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Introduction

The MB-3792/3792G ATX mainboard is a high-performance computer mainboard based on VIA ®VT82C694X chipset. The MB-3792/3792G is designed for Intel ® Dual Pentium ® III (FC-PGA) processor for cost-effective server markets.

The Apollo Pro133A (VT82C694X) is a Socket-370 system logic north bridge with the addition of 133 MHz capability for both the CPU and SDRAM interfaces. Apollo Pro133A may be used to implement both desktop and notebook personal computer systems from 66MHz to 133MHz based on Socket-370 (Pentium® III processor). The primary features of the Apollo Pro133A-North Bridge are: Slot-1 or Socket-370 CPU (Front Side Bus) Interface (66 / 100 / 133MHz), DRAM Memory Interface (66 / 100 / 133MHz), AGP Bus Interface (66MHz), PCI Bus Interface (33MHz), Mobile Power Management.

The VT82C686B PSIPC (PCI Super-I/O Integrated Peripheral Controller) is a high integration, high performance, power-efficient, and high compatibility device that supports Intel and non-Intel based processor to PCI bus bridge functionality to make a complete Microsoft PC99-compliant PCI/ISA system.

1.1 Specifications :

- **CPU** : Dual Pentium® III(FC-PGA) / Celeron™(PPGA)
- **FBS** : Support 66/100/133 MHz(Auto Detect)
- **DMA channels** : 7
- **Interrupt levels** : 15
- **Chipset** : VIA VT82C694X/VT82C686B
- **RAM memory** : Four 168-pin DIMM sockets support SDRAM/VCMM module. Support 8 banks up to 2GB at 100MHz(PC133 specifications, however, recommend a limit of 3 DIMMs or 6 banks at 133MHz for 1.5GB max memory). Support ECC(1-bit Error Code Correct) function
- **Ultra ATA/33/66/100 IDE Interface** : Two PCI Enhance IDE hard drives. The south bridge VT82C686B supports Ultra ATA/33/66/100 IDE interface.
- **Ultra ATA/33/66/100 Raid IDE Interface** : Two PCI Enhance Raid IDE hard drives. The PROMISE PD82267 supports Ultra ATA/33/66/100 Raid IDE interface. Support Raid function 0,1,0+1.
- **Floppy disk drive interface** : Single 2.88 MB, 1.44MB, 1.2MB, 720KB, or 360KB floppy disk drive.
- **Two high speed Series ports** : NS16C550 compatible UARTs
- **Bi-directional Parallel Port**
- **Built-in VT82C686B to monitor power supply voltage and fan speed status.**
- **IrDA port** : Support Serial Infrared(SIR) and Amplitude Shift Keyed IR(ASKIR) interface.
- **USB port** : Support two USB ports for future expansion.
- **AC'97 Codec** : Support two channel Left/Right Line IN/OUT, MIC IN, CD IN, and PC beep sound for buzzer.
- **VGA Controller** : SIS 6326 VGA controller, 4MB main memory .
Screen Resolution : up to 1600x1200 in 8-bit Color at 85Hz Refresh.
- **Dual Intel 82559 Fast Ethernet Multifunction PCI Controller** : IEEE 802.3u Auto-Negotiation support for 10BASE-T/100BASE-TX standard. Fast back-to-back transmission support with minimum interframe spacing. Connected to your LAN through RJ45 connector.

- **Gigabit Ethernet Controller** : IEEE 802.3z Auto-Negotiation support for 10BASE-T/100BASE-TX /1000BASE/T standard. Fast back-to-back transmission support with minimum interframe spacing. Connected to your LAN through RJ45 connector(MB-3792G only).
- **Keyboard connector**
- **Mouse** : PS/2 Mouse Port on-board.
- **Operating Temperature** : 0° ~ 55° C (CPU needs Cooler)

2

Installation

This chapter describes how to install the MB-3792/3792G. At first, the layout of MB-3792/3792G is shown, and the unpacking information that you should be careful is described. The jumpers and switches setting for the MB-3792/3792G's configuration, such as CPU type selection, system clock setting, are also included.

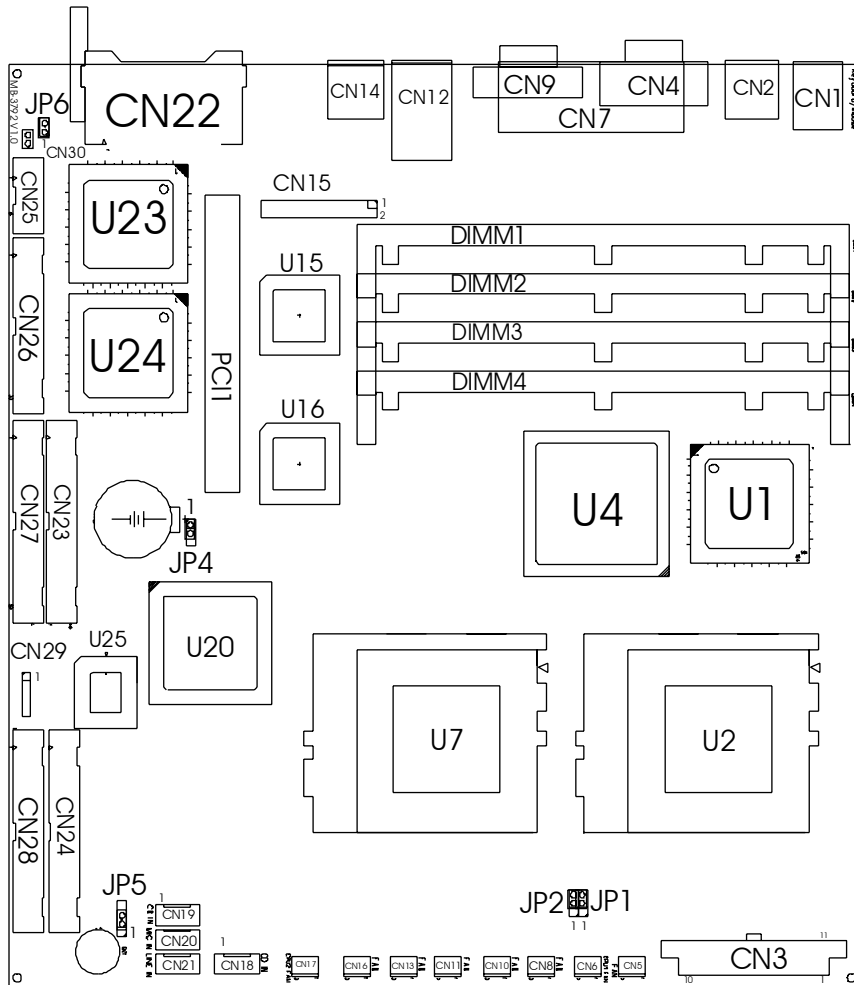
1.2 What You Have

In addition to this *User's Manual*, the MB-3792/3792G package includes the following items:

- MB-3792/3792G Pentium® III, Celeron® Single Board Computer
- FDD Cable x 1
- Audio(MIC,LINE IN)/RS-232 x 1
- IDE HDD DMA66/100 Cable x 2
- IDE HDD DMA33 Cable x 1
- CD-ROM Driver x 1
-

If any of these items is missing or damaged, contact the dealer from whom you purchased the product. Save the shipping materials and carton in case you want to ship or store the product in the future.

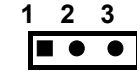
2.1 MB-3792/3792G's Layout



2.2 Clear CMOS Setup

If want to clear the CMOS Setup(for example forgot the password you should clear the setup and then set the password again.),you should close the JP4(2-3) about 3 seconds, then open again. Set back to normal operation mode.

- **JP4 : Clear CMOS Setup**



| | JP4 | DESCRIPTION |
|-----|---------------------------------------|-------------|
| 1-2 | Keep CMOS Setup (Normal Operation) | |
| 2-3 | Clear CMOS Setup | |

2.3 CompactFlash Card Master/Slave Mode Setting

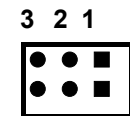
The CompactFlash socket is type II, and used IDE 2.

- **JP6 : Master/Slave Mode Setting**

| JP6 | DESCRIPTION |
|-------|-------------|
| SHORT | MASTER |
| OPEN | SLAVE |

2.4 CPU Type Selection Setting

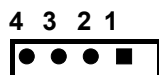
- **JP1, JP2 : CPU Type Selection**



| JP1, JP2 | DESCRIPTION |
|----------|-----------------------|
| 1-2 | PPGA(Celeron) |
| 2-3 | FC-PGA(Celeron/P III) |

2.5 Speaker Selection Setting

- JP5 : Speaker Selection



| JP5 | DESCRIPTION |
|-----|--|
| 1-4 | When remove 2-3 Jumper for Speaker use |
| 2-3 | Insert Jumper for Buzzer |

3

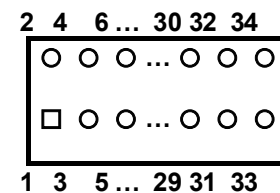
Connection

This chapter describes how to connect peripherals, switches and indicators to the MB-3792/3792G board.

3.1 Floppy Disk Drive Connector

MB-3792/3792G board is equipped with a 34-pin daisy-chain driver connector cable.

- CN26 : FDC CONNECTOR



| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---------|-------------|---------|-----------------|
| 1 | GROUND | 2 | REDUCE WRITE |
| 3 | GROUND | 4 | N/C |
| 5 | GROUND | 6 | N/C |
| 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 | N/C | 30 | READ DATA# |
| 31 | GROUND | 32 | SIDE 1 SELECT# |
| 33 | N/C | 34 | DISK CHANGE# |

3.2 PCI E-IDE Disk Drive Connector

You can attach four IDE(Integrated Device Electronics) device to the VT82C686B IDE controller.

And you can attach four IDE(Integrated Device Electronics) hard disk drives to the PDC20267 Raid IDE controller.

IDE2 shares the same IDE channel with CompactFlash, so you must refer JP6 before setting the IDE2's device.

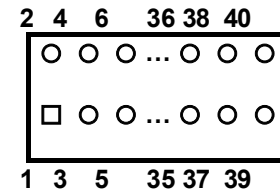
CN27 (IDE1) : Primary IDE Connector

CN23 (IDE2) : Secondary IDE Connector

CN28 (Raid IDE1) : Primary IDE Connector

CN24 (Raid IDE2) : Secondary IDE Connector

• **CN23/CN24/CN27/CN28 : IDE Interface Connector**



| PIN NO. | DESCRIPTION | PIN NO. | 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 | N/C |
| 21 | N/C | 22 | GROUND |
| 23 | IOW# | 24 | GROUND |
| 25 | IOR# | 26 | GROUND |
| 27 | N/C | 28 | BALE - DEFAULT |
| 29 | N/C | 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 |

3.3 Parallel Port

This port is usually connected to a printer, The MB-3792/3792G includes an on-board parallel port.

• CN7 : Parallel Port Connector

| PIN NO. | DESCRIPTION | PIN NO. | 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 | | |

3.4 USB Port Connector

The MB-3792/3792G built in two USB(Spec. 1.1) ports for the future new I/O bus expansion.

• CN2 : 2 ports USB Connector

Pin 1-4 for USB 1

Pin 5-8 for USB 0

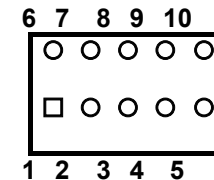
| | | | |
|----|--------|----|--------|
| 1. | VCC | 5. | VCC |
| 2. | DATA1- | 6. | DATA0- |
| 3. | DATA1+ | 7. | DATA0+ |
| 4. | GROUND | 8. | GROUND |

3.5 Serial Ports

The MB-3792/3792G offers two high speed NS16C550 compatible UARTs with 16 byte Read/Receive FIFO serial ports.

• CN4 : COM1(DB9)

• CN25 : COM2



• CN25 : Serial Port 10-pin Connector

| PIN NO. | | DESCRIPTION |
|---------|----|---------------------------|
| 1 | 1 | DATA CARRIER DETECT (DCD) |
| 2 | 2 | RECEIVE DATA (RXD) |
| 3 | 3 | TRANSMIT DATA (TXD) |
| 4 | 4 | DATA TERMINAL READY (DTR) |
| 5 | 5 | GROUND (GND) |
| 6 | 6 | DATA SET READY (DSR) |
| 7 | 7 | REQUEST TO SEND (RTS) |
| 8 | 8 | CLEAR TO SEND (CTS) |
| 9 | 9 | RING INDICATOR (RI) |
| | 10 | N/C |

3.6 Keyboard/Mouse Connector

The MB-3792/3792G provides 12-pin DIN keyboard/mouse connector.

• CN1 : 12-pin DIN Keyboard/Mouse Connector

| PIN NO. | DESCRIPTION |
|---------|---------------|
| 1 | KEYBOARD DATA |
| 2 | NC |

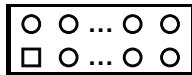
| | |
|----|----------------|
| 3 | GROUND |
| 4 | +5V |
| 5 | KEYBOARD CLOCK |
| 6 | NC |
| 7 | MOUSE DATA |
| 8 | NC |
| 9 | GROUND |
| 10 | +5V |
| 11 | MOUSE CLOCK |
| 12 | NC |

3.7 External Switches and Indicators

There are several external switches and indicators for monitoring and controlling your CPU board. All the functions are in the CN15 connector.

CN15 Pin Assignment and Functions :

2 4 ...24 26



1 3 ... 23 25

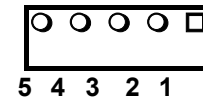
| PIN NO. | DESCRIPTION |
|---------|----------------------------|
| 1-2 | Power LED |
| 3-4 | HDD1 LED |
| 5-6 | RAID HDD LED |
| 7-8 | LAN1 Active/Link LED |
| 9-10 | LAN1 Speed LED |
| 11-12 | LAN2 Active/Link LED |
| 13-14 | LAN2 Speed LED |
| 15-16 | Gigabit LAN Link LED |
| 17-18 | Gigabit LAN Speed 100 LED |
| 19-20 | Gigabit LAN Speed 1000 LED |
| 21-22 | Gigabit LAN Active LED |
| 23-24 | Power Button |
| 25-26 | Reset Switch |

| LAN LED Description | | | |
|---------------------|---------|-----------|----------------------|
| Description | LED ON | LED OFF | LED Flashing |
| Speed LED | 100Mbps | 10Mbps | NA |
| Link/Active LED | Link Ok | Link Fail | Sending or Receiving |

3.8 IrDA Infrared Interface Port

The MB-3792/3792G built in a IrDA port which supports Serial Infrared(SIR) or Amplitude Shift Keyed IR(ASKIR) interface. When you use the IrDA port, you have to set COM2 as SIR or ASKIR mode in the BIOS's Peripheral Setup. Then the RS-232 mode of COM2 will be disabled.

• CN29 : IrDA connector



| PIN NO. | DESCRIPTION |
|---------|-------------|
| 1 | VCC |
| 2 | N/C |
| 3 | IR-RX |
| 4 | Ground |
| 5 | IR-TX |

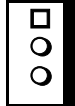
3.9 Fan Connector

The MB-3792/3792G provides CPU with cooling fan connector and chassis fan connector. These connectors can supply 12V/500mA to the cooling fan. There is a "rotation" pin in fan connector. This rotation pin is to get the fan's rotation signal to system. So the system BIOS could recognize the fan speed. Please be noted that only specific fan offers the rotation signal.

• CN17/CN6 : CPU Fan Connector

CN5/CN8/CN10/CN11/CN13/CN16 : System Fan Connector

- 1
- 2
- 3



| PIN NO. | CPU FAN | System FAN |
|---------|-----------------|------------|
| 1 | Rotation Signal | NC |
| 2 | 12V | 12V |
| 3 | Ground | Ground |

| | | | |
|----|--------|----|---------|
| 5 | GROUND | 6 | GROUND |
| 7 | GROUND | 8 | GROUND |
| 9 | NC | 10 | GROUND |
| 11 | NC | 12 | DDC DAT |
| 13 | HSYNC | 14 | VSYNC |
| 15 | DDCCLK | | |

3.10 LAN RJ45 Connector

MB-3792/3792G is equipped with dual Intel 82559 10/100Mbps Ethernet Controllers and one Gigabit NS DP83820/83861 10/100/1000Mb Ethernet Controller. You can connect it to your LAN through RJ45 LAN connector. The pin assignments are as follows:

• CN12/CN14(Gigabit) : LAN RJ45 Connector

| PIN NO. | CN12 | CN14 | PIN NO. | CN12 |
|---------|------|------|---------|------|
| 1 | TX+ | A- | 9. | TX+ |
| 2 | TX- | A+ | 10. | TX- |
| 3. | RX+ | B- | 11. | RX+ |
| 4. | N/C | B+ | 12. | N/C |
| 5 | N/C | C- | 13. | N/C |
| 6. | RX- | C+ | 14. | RX- |
| 7 | NC | D- | 15 | NC |
| 8 | NC | D+ | 16 | NC |

3.11 VGA Connector

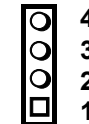
• CN9 : 15-pin Female Connector

| | | | |
|---|------|---|-------|
| 1 | RED | 2 | GREEN |
| 3 | BLUE | 4 | NC |

3.12 Audio Connectors

The onboard AC'97 Codec supports several audio functions. The audio connectors are described as below.

CN18/CN19/CN20/CN21 Connector



4
3
2
1

CN21 : LINE IN

| | |
|----|--------------|
| 1. | LEFT SIGNAL |
| 2. | GROUND |
| 3. | GROUND |
| 4. | RIGHT SIGNAL |

CN19 : CD IN

| | |
|----|-----------------|
| 1. | CD LEFT SIGNAL |
| 2. | GROUND |
| 3. | GROUND |
| 4. | CD RIGHT SIGNAL |

CN20 : MIC IN

| | |
|----|--------|
| 1. | SIGNAL |
| 2. | GROUND |
| 3. | GROUND |
| 4. | VCC |

CN21 : LINE OUT

| | |
|----|--------------|
| 1. | LEFT SIGNAL |
| 2. | GROUND |
| 3. | GROUND |
| 4. | RIGHT SIGNAL |

3.13 Gigabit LAN FAN Connector

CN30 : Gigabit LAN Fan Connector

| | |
|----|-----|
| 1. | GND |
| 2. | VCC |

3.14 CompactFlash Storage Card Socket

The MB-3792/3792G configures CompactFlash Storage Card in IDE Mode(Used IDE 2).

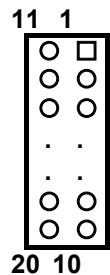
• CN22 : CompactFlash Storage Card Socket pin assignment

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---------|--------------|---------|-------------------------|
| 1 | GROUND | 26 | CARD DETECT1 |
| 2 | D3 | 27 | D11 |
| 3 | D4 | 28 | D12 |
| 4 | D5 | 29 | D13 |
| 5 | D6 | 30 | D14 |
| 6 | D7 | 31 | D15 |
| 7 | CS1# | 32 | CS3# |
| 8 | N/C | 33 | N/C |
| 9 | GROUND | 34 | IOR# |
| 10 | N/C | 35 | IOW# |
| 11 | N/C | 36 | OBLIGATORY TO PULL HIGH |
| 12 | N/C | 37 | IRQ15 |
| 13 | VCC | 38 | VCC |
| 14 | N/C | 39 | MASTER/SLAVE |
| 15 | N/C | 40 | N/C |
| 16 | N/C | 41 | RESET# |
| 17 | N/C | 42 | IRDY |
| 18 | A2 | 43 | N/C |
| 19 | A1 | 44 | OBLIGATORY TO PULL HIGH |
| 20 | A0 | 45 | ACTIVE# |
| 21 | D0 | 46 | PDIAG# |
| 22 | D1 | 47 | D8 |
| 23 | D2 | 48 | D9 |
| 24 | N/C | 49 | D10 |
| 25 | CARD DETECT2 | 50 | GROUND |
| | | | |

3.15 ATX Connector

The MB-3792/3792G offers one standard ATX power connector

CN3:



• **CN3: 20-pin Connector**

| PIN NO. | DESCRIPTION |
|---------|-------------|
| 1 | +3.3V |
| 2 | +3.3V |
| 3 | GND |
| 4 | +5V |
| 5 | GND |
| 6 | +5V |
| 7 | GND |
| 8 | Power Good |
| 9 | +5V SB |
| 10 | +12V |
| 11 | +3.3V |
| 12 | -12V |
| 13 | GND |
| 14 | PSON# |
| 15 | GND |
| 16 | GND |
| 17 | GND |
| 18 | -5V |
| 19 | +5V |
| 20 | +5V |

BIOS Setup

4.1 Introduction

This chapter discusses the Setup program built into the BIOS. The Setup program allows users to configure the system. This configuration is then stored in battery-backed CMOS RAM so that it retains the Setup information while the power is off.

4.2 Starting Setup

The BIOS is immediately active when you turn on the computer. While the BIOS is in control, the Setup program can be activated in one of two ways:

1. By pressing immediately after switching the system on, or
2. by pressing the key when the following message appears briefly at the bottom of the screen during the POST (Power On Self-Test).

Press DEL to enter SETUP.

If the message disappears before you respond and you still wish to enter Setup, restart the system to try again by turning it OFF then ON or pressing the "RESET" button on the system case. You may also restart by simultaneously pressing <Ctrl>, <Alt>, and <Delete> keys. If you do not press the keys at the correct time and the system does not boot, an error message will be displayed and you will again be asked to...

PRESS F1 TO CONTINUE, DEL TO ENTER SETUP

4.3 Using Setup

In general, you can use the arrow keys to highlight items, press <Enter> to select, use the PageUp and PageDown keys to change entries, press <F1> for help and press <Esc> to quit. The following table provides more details about how to navigate in the Setup program using the keyboard.

| Key | Function |
|-------------|--|
| Up Arrow | Move to the previous item |
| Down Arrow | Move to the next item |
| Left Arrow | Move to the item on the left (menu bar) |
| Right Arrow | Move to the item on the right (menu bar) |
| Esc | Main Menu: Quit without saving changes Submenus: Exit Current page to the next higher level menu |
| Move Enter | Move to the item you desired |
| PgUp key | Increase the numeric value or make changes |
| PgDn key | Decrease the numeric value or make changes |
| + key | Increase the numeric value or make changes |
| - key | Decrease the numeric value or make changes |
| Esc key | Main Menu -- Quit and not save changes into CMOS Status Page Setup Menu and Option Page Setup Menu -- Exit current page and return to Main Menu |
| F1 key | General help on Setup navigation keys |
| F5 key | Load previous values from CMOS |
| F6 key | Load the fail-safe defaults from BIOS default table |
| F7 key | Load the optimized defaults |
| F10 key | Save all the CMOS changes and exit |

4.4 Main Menu

Once you enter the AwardBIOS™ CMOS Setup Utility, the Main Menu will appear on the screen. The Main Menu allows you to select from several setup functions and two exit choices. Use the arrow keys to select among the items and press <Enter> to accept and enter the sub-menu.

CMOS Setup Utility - Copyright (C) 1984-2000 Award Software

| | |
|--|---------------------------|
| 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 |
| PC Health Status | Exit Without Saving |
| Esc : Quit ↑↓←→ : Select Item | |
| F10 : Save & Exit Setup | |
| Time, Date, Hard Disk Type.... | |

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

4.4.1 Setup Items

The main menu includes the following main setup categories. Recall that some systems may not include all entries.

Standard CMOS Features

Use this menu for basic system configuration. See Section 4.5 for the details.

Advanced BIOS Features

Use this menu to set the Advanced Features available on your system. See Section 4.6 for the details.

Advanced Chipset Features

Use this menu to change the values in the chipset registers and optimize your system's performance. See section 4.7 for the details.

Integrated Peripherals

Use this menu to specify your settings for integrated peripherals. See section 4.8 for the details.

Power Management Setup

Use this menu to specify your settings for power management. See section 4.9 for the details.

PnP / PCI Configurations

This entry appears if your system supports PnP / PCI. See section 4.10 for the details.

PC Health Status

Use this menu to monitor your hardware.

Frequency/Voltage Control

Use this menu to specify your settings for frequency/voltage control. See section 4.12 for the details.

Load Fail-Safe Defaults

Use this menu to load the BIOS default values for the minimal/stable performance for your system to operate. See section 4.13 for the details.

Load Optimized Defaults

Use this menu to load the BIOS default values that are factory settings for optimal performance system operations. While Award has designed the custom BIOS to maximize performance, the factory has the right to change these defaults to meet their needs. See section 4.13 for the details.

Supervisor / User Password

Use this menu to set User and Supervisor Passwords. See section 4.14 for the detail.

Save & Exit Setup

Save CMOS value changes to CMOS and exit setup. See section 4.15 for the details.

Exit Without Save

Abandon all CMOS value changes and exit setup. See section 4.15 for the details.

4.5 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 you want in each item.

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Standard CMOS Features

| | | Item Help |
|-----------------|--|--|
| Date: | Mon, Feb 8 2000 | |
| Time: | 16:19:20 | |
| > | IDE Primary Master Press Enter 2557 MB | Menu Level > |
| > | IDE Primary Slave Press Enter None | |
| > | IDE Secondary Master Press Enter None | Change the day, month, 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 | 64512K | |
| Total Memory | 65536K | |

↑↓←→Move Enter: Select +/-/PU/PD: Value F10:Save ESC: Exit F1:General Help
F5:Previous Values F6:Fail-safe defaults F7:Optimized Defaults

Figure 1: The Main Menu

Main Menu Selections

| Item | Options | Description |
|----------------------|--|---|
| Date | MM DD YYYY | Set the system date. |
| Time | HH : MM : SS | Set the system time |
| IDE Primary Master | Options are in its sub menu (described in Table 3) | Press <Enter> to enter the sub menu of detailed options |
| IDE Primary Slave | Options are in its sub menu (described in Table 3) | Press <Enter> to enter the sub menu of detailed options |
| IDE Secondary Master | Options are in its sub menu (described in Table 3) | Press <Enter> to enter the sub menu of detailed options |
| IDE Secondary Slave | Options are in its sub menu (described in Table 3) | Press <Enter> to enter the sub menu of detailed options |
| Drive A Drive B | None 360K, 5.25 in 1.2M, 5.25 in 720K, 3.5 in 1.44M, 3.5 in 2.88M, 3.5 in | Select the type of floppy disk drive installed in your system |
| Video | EGA/VGA CGA 40 CGA 80 MONO | Select the default video device |
| Halt On | All Errors No Errors All, but Keyboard All, but Diskette All, but Disk/Key | Select the situation in which you want the BIOS to stop the POST process and notify you |
| Base Memory | N/A | Displays the amount of conventional memory detected during boot up |
| Extended Memory | N/A | Displays the amount of extended memory detected during boot up |
| Total Memory | N/A | Displays the total memory available in the system |

Table 2 Main Menu Selections

IDE Adapters

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

Figure 2 shows the IDE primary master sub menu.

CMOS Setup Utility – Copyright © 1984-2000 Award Software
IDE Primary Master

| | | |
|--|-------------|--|
| IDE HDD Auto-Detection | Press Enter | Item Help |
| IDE Primary Master | Auto | Menu Level >> |
| Access Mode | Auto | To auto-detect the HDD's size, head... on this channel |
| Capacity | 2557 MB | |
| Cylinder | 4956 | |
| Head | 16 | |
| Precomp | 0 | |
| Landing Zone | 4955 | |
| 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 2 IDE Primary Master sub menu

Use the legend keys to navigate through this menu and exit to the main menu. Use Table 3 to configure the hard disk.

| Item | Options | Description |
|---|-----------------------------------|--|
| IDE HDD Auto-detection | Press Enter | Press Enter to auto-detect the HDD on this channel. If detection is successful, it fills the remaining fields on this menu. |
| IDE Primary Master | None Auto Manual | Selecting 'manual' lets you set the remaining fields on this screen. Selects the type of fixed disk. "User Type" will let you select the number of cylinders, heads, etc. Note: PRECOMP=65535 means NONE ! |
| Capacity | Auto Display your disk drive size | Disk drive capacity (Approximated). Note that this size is usually slightly greater than the size of a formatted disk given by a disk checking program. |
| Access Mode | CHS LBA Large Auto | Choose the access mode for this hard disk |
| The following options are selectable only if the 'IDE Primary Master' item is set to 'Manual' | | |
| Cylinder | Min = 0 Max = 65535 | Set the number of cylinders for this hard disk. |
| Head | Min = 0 Max = 255 | Set the number of read/write heads |
| Precomp | Min = 0 Max = 65535 | **** Warning: Setting a value of 65535 means no hard disk |
| Landing zone | Min = 0 Max = 65535 | **** |
| Sector | Min = 0 Max = 255 | Number of sectors per track |

Table 3 Hard disk selections

4.6 Advanced BIOS Features

This section allows you to configure your system for basic operation. You have the opportunity to select the system's default speed, boot-up sequence, keyboard operation, shadowing and security.

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Advanced BIOS Features

| | | |
|--|------------|--|
| Virus Warning | [Disabled] | Item Help |
| CPU Internal Cache | [Enabled] | |
| External Cache | [Enabled] | Menu Level > |
| CPU L2 Cache ECC Checking | [Enabled] | |
| Processor Number Feature | [Enabled] | Allows you 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 alarm beep |
| Quick Power On Self Test | [Enabled] | |
| First Boot device | [Floppy] | |
| Second Boot device | [HDD-0] | |
| Third Boot device | [SCSI] | |
| Boot other device | [Enabled] | |
| Swap Floppy Drive | [Disabled] | |
| Boot Up Floppy Seek | [Disabled] | |
| Boot Up NumLock Status | [On] | |
| Gate A20 Option | [Fast] | |
| Typematic Rate Setting | [Disabled] | |
| Typematic Rate (Chars/Sec) | [6] | |
| Typematic Delay (Msec) | [250] | |
| Security Option | [Setup] | |
| MPS Version Control For OS | [1.4] | |
| OS Select For DRAM > 64MB | [Non-OS2] | |
| Video BIOS For Shadow | [Enabled] | |
| C8000-CBFFF Shadow | [Disabled] | |
| CC000-CFFFF Shadow | [Disabled] | |
| D0000-D3FFF Shadow | [Disabled] | |
| D4000-D7FFF Shadow | [Disabled] | |
| D8000-DBFFF Shadow | [Disabled] | |
| DC000-DFFFF Shadow | [Disabled] | |
| ↑↓←→Move Enter: Select +/-PU/PD: Value F10:Save ESC:Exit F1:General Help F5:Previous Values F6:Fail-safe defaults F7:Optimized Defaults | | |

Virus Warning

Allows you 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 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, it depends on CPU/chipset design.
The choice: Enabled, Disabled.

CPU L2 Cache ECC Checking

This item allow you to enabled/disabled CPU L2 Cache ECC checking.
The choice: Enabled, Disabled.

Processor Number Feature

This item allows you to enable/disable support KLAMATH.
The choice: Enabled, Disabled.

Quick Power On Self Test

This category speeds up Power On Self Test (POST) after you power up the computer. If it is set to Enable, BIOS will shorten or skip some check items during POST.
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, ZIP100, LAN, Disabled.

Swap Floppy Drive

If the system has two floppy drives, you 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

Keystrokes 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.

Security Option

Select whether the password is required every time the system boots or only when you enter setup.

| | |
|--------|---|
| 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 you 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 you can enter Setup 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.

The choice: Yes, No.

4.7 Advanced Chipset Features

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Advanced Chipset Features

| | | |
|-------------------------|------------|--------------|
| DRAM Timing By SPD | [Enabled] | Item Help |
| DRAM Clock | [Host CLK] | |
| SDRAM Cycle Length | [3] | Menu Level > |
| Bank Interleave | [Disabled] | |
| Memory Hole | [Disabled] | |
| P2C/C2P Concurrency | [Enabled] | |
| System BIOS Cacheable | [Disabled] | |
| OnChip USB | [Enabled] | |
| USB Keyboard Support | [Disabled] | |
| OnChip Sound | [Auto] | |
| CPU to PCI Write Buffer | [Enabled] | |
| PCI Dynamic Bursting | [Enabled] | |
| PCI Master 0 WS Write | [Enabled] | |
| PCI Delay transaction | [Enabled] | |
| PC#2 Access #1 Retry | [Enabled] | |
| Memory Parity/ECC Check | [Disabled] | |

↑↓←→ Move Enter: Select +/-PU/PD: Value F10: Save ESC: Exit F1: General Help
F5: Previous Values F6: Fail-safe defaults F7: Optimized Defaults

This section allows you 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 your system. The only time you might consider making any changes would be if you discovered that data was being lost while using your system.

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 is being lost. Such a scenario might well occur if your system had mixed speed DRAM chips installed so that greater delays may

be required to preserve the integrity of the data held in the slower memory chips.

DRAM Timing By SPD

This item allows you to select the value in this field, depending on whether the board has paged DRAMs or EDO (extended data output) DRAMs.

The Choice: Enabled, Disabled.

DRAM Clock

This item allows you to control the DRAM speed.

The Choice: Host Clock, HCLK-33M, HCLK+33M.

SDRAM Cycle Length

When synchronous DRAM is installed, the number of clock cycles of CAS latency depends on the DRAM timing. Do not reset this field from the default value specified by the system designer.

The Choice: 2, 3.

Memory Hole

In order to improve performance, certain space in memory is reserved for ISA cards.

This memory must be mapped into the memory space below 16MB.

The Choice: 15M-16M, Disabled.

P2c/C2P Concurrency

This item allows you to enable/disable the PCI to CPU, CPU to PCI concurrency.

The choice: Enabled, Disabled.

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.

OnChip USB

This should be enabled if your system has a USB installed on the system board and you want to use it. Even when so equipped, if you add a higher performance controller, you will need to disable this feature.

The Choice: Enabled, Disabled.

USB Keyboard Support

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

The Choice: Enabled, Disabled.

OnChip Sound

This item allows you to control the onboard AC 97 audio.
The Choice: Auto, Disabled.

CPU to PCI Write Buffer

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

PCI Dynamic Bursting

When *Enabled*, every write transaction goes to the write buffer. Burstable transactions then burst on the PCI bus and nonburstable transactions don't.
The Choice: Enabled, Disabled.

PCI Master 0 WS Write

When *Enabled*, writes to the PCI bus are executed with zero wait states.
The Choice: Enabled, Disabled.

PCI 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.

PCI#2 Access #1 Retry

When disabled, PCI#2 will not be disconnected until access finishes (default). When enabled, PCI#2 will be disconnected if max retries are attempted without success.
The Choice: Enabled, Disabled.

Memory Parity/ECC Check

This item *enabled* to detect the memory parity and Error Checking & Correcting.
The Choice: Enabled, Disabled.

4.8 Integrated Peripherals

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Integrated Peripherals

| | | Item Help |
|------------------------|------------|---------------------------------|
| OnChip IDE Channel0 | [Enabled] | |
| OnChip IDE Channel1 | [Enabled] | |
| IDE Prefetch Mode | [Enabled] | |
| Primary Master PIO | [Auto] | Menu Level > |
| Primary Slave PIO | [Auto] | If your IDE hard drive supports |
| Secondary Master PIO | [Auto] | block mode select Enabled |
| Secondary Slave PIO | [Auto] | for automatic detection of the |
| Primary Master UDMA | [Auto] | optimal number of block |
| Primary Slave UDMA | [Auto] | read/write per sector the drive |
| Secondary Master UDMA | [Auto] | can support |
| Secondary Slave UDMA | [Auto] | |
| Init Display First | [PCI Slot] | |
| IDE HDD Block Mode | [Enabled] | |
| Onboard FDC Controller | [Enabled] | |
| Onboard Serial Port 1 | [Auto] | |
| Onboard Serial Port 2 | [Auto] | |
| UART 2 Mode | [Standard] | |
| IR Function Duplex | [Half] | |
| TX,RX inverting enable | [No, Yes] | |
| Onboard Parallel Port | [378/RQ7] | |
| Onboard Parallel Mode | [Normal] | |
| ECP Mode Use DMA | [3] | |
| Parallel Port EPP Type | [EPP1.9] | |
| Onboard Legacy Audio | [Disabled] | |
| Sound Blaster | [Enabled] | |
| SB I/O Base Address | [220H] | |
| SB IRQ Select | [IRQ 5] | |
| SB DMA Select | [DMA 1] | |

↑↓←→ Move Enter: Select +/-PU/PD: Value F10:Save ESC:Exit F1:General Help
F5:Previous Values F6:Fail-safe defaults F7:Optimized Defaults

On-Chip IDE Channel0/1

The chipset contains a PCI IDE interface with support for two IDE channels. Select Enabled to activate the primary IDE interface. Select Disabled to deactivate this interface

The choice: Enabled, Disabled.

IDE Prefetch Mode

The onboard IDE drive interfaces supports IDE prefetching for faster drive accesses. If you install a primary and/or secondary add-in IDE interface, set this field to *Disabled* if the interface does not support prefetching.

The choice: Enabled, Disabled.

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.

Primary/Secondary Master/Slave UDMA

Ultra DMA-33/66/100 implementation is possible only if your 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 your hard drive and your system software both support Ultra DMA-33/66/100, select Auto to enable BIOS support.

The Choice: Auto, Mode 0, Mode 1, Mode 2, Mode 3, Mode 4.

Init Display First

This item allows you to decide to active whether PCI Slot of VGA card first.

The choice: PCI Slot, AGP .

IDE HDD Block Mode

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

The choice: Enabled, Disabled

Onboard FDC Controller

Select Enabled if your system has a floppy disk controller (FDC) installed on the system board and you wish to use it. If you install and-in FDC or the system has no floppy drive, 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 2 Mode

This item allows you to select which mode for the Onboard Serial Port 2.

The choice: Standard, HPSIR, ASKIR.

IR Function Duplex

This item allows you to select the IR half/full duplex function.

The choice: Half, Full.

TX ,RX inverting enable

This item allow you to enable the TX, RX inverting which depends on different H/W requirement. This field is not recommended to change its default setting for avoiding any error in your system

The choice: No, No/ No,Yes(Default)/ Yes, No/ Yes, Yes.

Onboard Parallel Port

This item allows you to determine onboard parallel port controller I/O address setting.

The choice: 378/IRQ7, 278/IRQ5, 3BC/IRQ7, Disabled,

Parallel Port Mode

Select an operating mode for the onboard parallel (printer) port. Select *Normal*, *Compatible*, or *SPP* unless you are certain your hardware and software both support one of the other available modes.

The choice: Normal, EPP, ECP,ECP/EPP

ECP Mode Use DMA

Select a DMA channel for the parallel port for use during ECP mode.

The choice: 3, 1.

Parallel Port EPP Type

elect EPP port type 1.7 or 1.9.

The choice: EPP1.7, EPP1.9

Onboard Legacy Audio

This field controls the onboard legacy audio.

The choice: Enabled, Disabled.

Sound Blaster

Sound Blaster support.

The choice: Enabled, Disabled

SB I/O Base Address

This item allows you to determine Sound Blaster I/O address setting.

The choice: 220H, 240H, 260H, 280H

SB IRQ Select

This item allows you to determine Sound Blaster IRQ setting.

The choice: IRQ 5, IRQ 7, IRQ 9, IRQ 10

SB DMA Select

This item allows you to determine Sound Blaster DMA setting.

The choice: DMA 0, DMA 1, DMA 2, DMA 3

4.9 Power Management Setup

The Power Management Setup allows you to configure you system to most effectively save energy while operating in a manner consistent with your own style of computer use.

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Power Management Setup

| | | |
|--------------------|------------------|--------------|
| ACPI function | [Enabled] | Item Help |
| > Power Management | [Press Enter] | |
| PM Control by APM | [Yes] | Menu Level > |
| Video Off Option | [Suspend -> Off] | |
| Video Off Method | [V/H SYNC+Blank] | |
| MODEM Use IRQ | [3] | |
| Soft-Off by PWRBTN | [Instant-Off] | |
| > Wake Up Events | [Press Enter] | |

↑↓←→Move Enter: Select +/-PU/PD: Value F10:Save ESC: Exit F1:General Help
F5:Previous Values F6:Fail-safe defaults F7:Optimized Defaults

The Power Management Setup allows you to configure you system to most effectively save energy while operating in a manner consistent with your own style of computer use.

ACPI Function

This item allows you to enable/disable the Advanced Configuration and Power Management (ACPI).

The choice: Enabled, Disabled.

Power Management

This category allows you to select the type (or degree) of power saving and is directly related to the following modes:

1. **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.
2. **Doze Mode**: When enabled and after the set time of system inactivity, the CPU clock will run at slower speed while all other devices still operate at full speed.

3. **Suspend Mode**: When enabled and after the set time of system inactivity, all devices except the CPU will be shut off.

There are four selections for Power Management, three of which have fixed mode settings.

| | |
|-------------------|---|
| 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. |

PM Control by APM

When enabled, an Advanced Power Management device will be activated to enhance the Max. Power Saving mode and stop the CPU internal clock. If Advance Power Management (APM) is installed on your system, selecting Yes gives better power savings. If the Max. Power Saving is not enabled, this will be preset to No.

The choice: Yes, No.

Video Off Option

When enabled, this feature allows the VGA adapter to operate in a power saving mode.

| | |
|-------------------|---|
| Always On | Monitor will remain on during power saving modes. |
| Suspend --> Off | Monitor blanked when the systems enters the Suspend mode. |
| All Modes --> Off | Monitor blanked when the system enters any power saving mode. |

Video Off Method

This determines the manner in which the monitor is blanked.

| | |
|----------------|--|
| V/H SYNC+Blank | This selection will cause the 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 | Select this option if your monitor supports the Display Power Management Signaling (DPMS) standard of the Video Electronics Standards to select video power management values. |

MODEM Use IRQ

This determines the IRQ in which the MODEM can use.

The choice: 3, 4, 5, 7, 9, 10, 11, NA.

Soft-Off by PWRBTN

Pressing the power button for more than 4 seconds forces the system to enter the Soft-Off state when the system has "hung."

The choice: Delay 4 Sec, Instant-Off.

Wake Up Event

Wake Up 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 to a device which is configured as *On*, even when the system is in a power down mode.

VGA

When *Enabled*, you can set the VGA awakens the system.

LPT & COM

When *On* of LPT & COM, any activity from one of the listed system peripheral devices or IRQs wakes up the system.

HDD & FDD

When *On of HDD & FDD*, any activity from one of the listed system peripheral devices wakes up the system.

PCI Master

When *On of PCI Master*, any activity from one of the listed system peripheral devices wakes up the system.

RTC Alarm Resume

When *Enabled*, you can set the date and time at which the RTC (real-time clock) alarm awakens the system from Suspend mode.

The following is a list of IRQs, Interrupt ReQuests, which can be exempted much as the COM ports and LPT ports above can. When an I/O device wants to gain the attention of the operating system, it signals this by causing an IRQ to occur. When the operating system is ready to respond to the request, it interrupts itself and performs the service.

When set *On*, activity will neither prevent the system from going into a power management mode nor awaken it.

- **Primary INTR**
- **IRQ3 (COM 2)**
- **IRQ4 (COM 1)**
- **IRQ5 (LPT 2)**
- **IRQ6 (Floppy Disk)**
- **IRQ7 (LPT 1)**
- **IRQ8 (RTC Alarm)**
- **IRQ9 (IRQ2 Redir)**
- **IRQ10 (Reserved)**
- **IRQ11 (Reserved)**
- **IRQ12 (PS / 2 Mouse)**
- **IRQ13 (Coprocessor)**
- **IRQ14 (Hard Disk)**
- **IRQ15 (Reserved).**

4.10 PnP/PCI Configuration Setup

This section describes configuring the PCI bus system. PCI, or **Personal Computer Interconnect**, 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.

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PnP/PCI Configurations

| | Item Help |
|--------------------------------------|--|
| PnP OS Installed [No] | |
| Reset Configuration Data [Disabled] | |
| Resources Controlled By [Auto(ESCD)] | |
| x IRQ Resources [Press Enter] | |
| x DMA Resources [Press Enter] | |
| PCI/VGA Palette Snoop [Disabled] | |
| Assign IRQ For USB [Enabled] | |
| | Menu Level ➤ |
| | 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 |

↑↓←→Move Enter: Select +/-PU/PD: Value F10:Save ESC: Exit F1:General Help
F5:Previous Values F6:Fail-safe defaults F7:Optimized Defaults

PnP OS Installed

This item allows you to determine install PnP OS or not.
The choice: Yes, No.

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 can not boot.
The choice: Enabled, Disabled .

Resource controlled by

The Award Plug and Play BIOS has the capacity to automatically configure all of the boot and 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” 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.

IRQ3/4/5/7/9/10/11/12/14/15 assigned to

Legacy ISA Devices compliant with the original PC AT bus specification, requiring a specific interrupt (such as IRQ4 for serial port 1). PCI/ISA PnP Devices compliant with the Plug and Play standard, whether designed for PCI or ISA bus architecture.

The Choice: PCI/ISA PnP, Legacy ISA.

DMA Resource

When resources are controlled manually, assign each system DMA channel a type, depending on the type of device using the DMA channel.

DMA 0/1/3/5/6/7 assigned to

Legacy ISA for devices compliant with the original PC AT bus specification, PCI/ISA PnP for devices compliant with the Plug and Play standard whether designed for PCI or ISA bus architecture.

The Choice: Legacy ISA and PCI/ISA PnP.

PCI/VGA Palette Snoop

Leave this field at *Disabled*.

The Choice: Enabled, Disabled.

Assign IRQ For USB

Enable/Disable to assign IRQ for USB.

The Choice: Enabled, Disabled.

4.11 PC Health Status

CMOS Setup Utility – Copyright © 1984-2000 Award Software
PC Health Status

| | | |
|------------------------|---------|--------------|
| Current CPU1 Temp. | 46°C | Item Help |
| Current CPU2 Temp. | 48°C | ----- |
| Current CPU1 FAN Speed | 5336RPM | Menu Level > |
| Current CPU2 FAN Speed | 5353RPM | |
| CPU1 V-Core | 1.75V | |
| CPU2 V-Core | 1.73V | |
| System 3.3V | 3.32V | |
| System 5V | 5.01V | |
| System 12V | 12.35V | |

↑↓←→ Move Enter: Select +/-PU/PD: Value F10:Save ESC: Exit F1:General Help
F5:Previous Values F6:Fail-safe defaults F7:Optimized Defaults

4.12 Frequency/Voltage Control

CMOS Setup Utility – Copyright © 1984-2000 Award Software
Frequency/Voltage Control

| | |
|--|------------------------------------|
| Auto Detect DIMM/PCI Clk [Enabled] CPU Clock/Spread Spectrum [Default] | 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 | |

Auto Detect DIMM/PCI Clk

This item allows you to enable/disable auto detect DIMM/PCI Clock.
The choice: Enabled, Disabled.

CPU Clock/Spread Spectrum

This item allows you to select the CPU Clk/spread spectrum modulate.
The choice: 124MHz/On, 133MHz/Off, 133MHz/On, 138MHz/Off, 140MHz/On,
150MHz/On.

4.13 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 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.

4.14 Supervisor/User Password Setting

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

supervisor password :

can enter and change the options of the setup menus.

user password :

just can only enter but do not have the right to change the options of the setup menus. When you select this function, the following message will appear at the center of the screen to assist 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 you can enter Setup freely.

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.

4.15 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.

APPENDIX A. RAID FastTrak100

1. Introduction

Promise designed its FastTrak100 to provide a cost-effective, high performance RAID that adds performance and/or reliability to PC desktops and/or servers using Ultra ATA/100, Ultra ATA/66, or EIDE drives.

FastTrak100 supports striping (RAID 0), mirroring (RAID 1), striping/mirroring (RAID 0+1), or spanning (JBOD) operation, respectively.

With striping, identical drives can read and write data in parallel to increase performance. Mirroring increases read performance through load balancing and elevator sorting while creating a complete backup of your files. Striping with mirroring offers both high read/write performance and error tolerance. Spanning uses the full capacity of all attached drives without requiring identical drive size, but offers no other RAID functionality.

A FastTrak100 striped array can double the sustained data transfer rate of Ultra ATA/66 drives. FastTrak100 fully supports Ultra ATA/100 specification of up to 100 MB/sec per drive, depending on individual drive specifications.

FastTrak100 also offers fault tolerant, data redundancy for entry-level network file servers or simply for desktop PC users wanting to continually protect valuable data on their PC. FastTrak100 offers RAID 1 mirroring (for two drives) and RAID 0+1 mirroring and striping (for four drives) to protect data. Should a drive that is part of a mirrored array fail, FastTrak100 uses the mirrored drive (which contains identical data) to assume all data handling. When a new replacement drive is later installed, FastTrak100 rebuilds data to the new drive from the mirrored drive to restore fault tolerance.

FastTrak100's bootable BIOS supports individual drives larger than 8.4GB. With FAT32 and NTFS partitioning, the array can be addressed as one large *single* volume.

The FastTrak100 controller provides two IDE hard drive connectors that support Ultra ATA/100 protocols, perfect for such demanding applications as real-time video, multimedia, and high-performance operating systems. FastTrak100's two IDE connectors each support a master/slave combination of any IDE devices, including IDE, EIDE, Fast-ATA, and Ultra-ATA standards. Devices of different standards can be connected to FastTrak100 without performance degradation,

due to the independent programmable timing registers in the controller's design.

2. Software Installation

This section details the FastTrak100 driver installation procedure when used with various operating systems as follows:

- Windows 2000
- Microsoft Millenium
- Windows 98
- Windows NT 4.x
- Linux

You can install from CDROM drive or **copy it to disk from CDROM.**

2-1 Windows 2000

2-1-1 Installing Driver during New Windows 2000 installation

1a. Floppy Install: Boot the computer with the Windows 2000 installation diskettes.

1b. Floppyless Install: Boot from floppy and type "WINNT". After files have been copied, the system will reboot. On the reboot, press <F6> after the message "Setup is inspecting your computer's hardware configuration..." appears.

1c. CD-ROM Install: Boot from the CD-ROM. Press <F6> after the message "Press F6 if you need to install third party SCSI or RAID driver" appears.

2. When the "Windows 2000 Setup" window is generated, press "S" to Specify an Additional Device(s)

3. Press "O" to select "Other" and press the "Enter" key.

4. Insert the Promise Technology driver diskette into drive A: and press "Enter" key.

5. Choose "Win2000 Promise FastTrak100 Controller" from the list that appears on screen, then press the "Enter" key.

6. The Windows 2000 Setup screen will appear again saying "Setup will load support for the following mass storage devices:" The list will include "Win2000 Promise FastTrak100 controller"..

NOTE: *If you need to specify any additional devices to be installed, do so at this time. Once all devices are specified, continue to step 6.*

7. From the Windows 2000 Setup screen, press the Enter key. Setup will now load all device files and then continue the Windows 2000 installation.

2-1-2 Installing Driver in Existing Windows 2000 System

WARNING: If you will be moving the boot drive containing the existing Windows 2000 operating system to the FastTrak100 card, the Ultra100 driver **MUST** be loaded on to this hard drive while it is still attached to your existing hard drive controller. Do not attach this drive or any other hard drive to the FastTrak100 controller card before completing this step. After installing the FastTrak100 card and rebooting your system, Windows 2000 setup will show a "New Hardware Found" dialog box.

1. In the dialog box, choose "Driver from disk provided by hardware manufacturer" button.
2. In the A: drive, insert the FastTrak100 driver diskette.
3. Type "A:\WIN2000" in the text box. Press "Enter".
4. Choose "Win2000 Promise FastTrak100 IDE Controller" from the list that appears on screen, then press the "Enter" key.
5. The Windows 2000 Setup screen will appear again saying "Setup will load support for the following mass storage devices – Win2000 Promise FastTrak100 IDE controller". The FastTrak100 driver will now be copied on to the system and entered into the Windows 2000 driver database.
6. When the "System Settings Change" dialog box appears, remove the floppy diskette and click on "Yes" to restart the system. Windows 2000 will then restart for the driver installation to take effect.
7. Power off your system, then attach your hard drive to the FastTrak100 controller .

Confirming Windows 2000 Installation

1. From Windows 2000, open the Control Panel from "My Computer" followed by the System icon.
2. Choose the "Hardware" tab, then click the "Device Manager" tab.
3. Click the "+" in front of "SCSI controllers." "Promise Technology, Inc. FASTTRAK100 IDE controller" should appear.

2-2 Microsoft Millennium

2-2-1 Installing Drivers During Millennium Installation

The following details the installation of the FastTrak100 drivers while installing Microsoft's Millennium (with the FastTrak100 controller card already in place). If you're installing the FastTrak100 drivers on a system with Millennium already installed, see "Installing Drivers with Existing Millennium System."

1. Install Microsoft Millennium fully.
2. After installation, go the "Start" menu and choose "Settings."
3. From the "Settings" menu, choose "Control Panel."
4. In the "Control Panel" window, double-click on the "System" icon.
5. In the "System" window, choose the "Device Manager" tab.
6. In the hierarchical display under "Other Devices" is a listing for "PCI Mass Storage Controller." Choose it and then press the "Properties" button.
7. Choose the "Driver" tab in the "Properties" window, choose "Update Driver," and then press "Next."
8. Choose "Search for a better driver than the one your device is using now (recommended)," then press "Next."
9. Choose "Specify Location," then type "A:\WINMILL" in the text box.
10. Insert the "FastTrak100 Driver" diskette into the A: drive.
11. Press the "Next" button. A message informing you that Millennium has found "Windows Millennium Promise FASTTRAK100 (tm) IDE Controller" should appear.
12. Press "Next," then "Finish," then "Yes" when asked if you want to restart your computer. Be sure to remove the diskette from drive A:.

2-2-2 Installing Drivers with Existing Millennium System

The following section details the installation of FastTrak100 drivers on a system that has Millennium already installed and running. If you're installing the FastTrak100 drivers on a system during an installation of Millennium, see "Installing Drivers During Millennium Installation."

1. After installing the FastTrak100 controller card and configuring the hard drives, power up the system and boot.
2. The "Add New Hardware Wizard" will appear, informing you that it has found a "PCI Mass Storage Controller."
3. Click on "Next," and from the generated list box, choose "Search for a better driver than the one your device is using now."
4. Click on "Next," and from the generated choices, choose "Specify a location."
5. Insert the "FastTrak100 Driver" diskette in drive A:.
6. Type "A:\WINMILL" in the text box that appears.
7. Click on "Next." A message informing you that Millennium has found "Windows Millennium Promise FASTTRAK100 (tm) IDE Controller" should appear.
8. Click on "Next," and then on "Finish."

9. Choose "Yes" when asked if you want to restart your computer. Be sure to eject the diskette from drive A:.

Confirming Driver Installation in Millennium

To confirm that the driver has been properly loaded in Millennium, perform the following steps:

1. Choose "Settings" from the "Start" menu.
2. Choose "Control Panel," and then double-click on the "System" icon. Choose the "Device Manager" tab, and then click the "+" in front of "SCSI controllers." "Windows Millennium Promise FASTTRAK100 (tm) IDE controller" should appear.

2-3 Windows 98

5.2-3-1 Installing Drivers During Windows 98 Installation

The following details the installation of the FastTrak100 drivers while installing Windows 98 (with the FastTrak100 controller card already in place). If you're installing the FastTrak100 drivers on a system with Windows 98 already installed, see "Installing Drivers with Existing Windows 98."

1. After installing the FastTrak100 controller card and configuring the hard drive(s), partition and format your hard drive(s), if necessary.
2. Install Windows 98 normally.
3. After installation, go the "Start" menu and choose "Settings."
4. From the "Settings" menu, choose "Control Panel."
5. In the "Control Panel" window, double-click on the "System" icon.
6. In the "System" window, choose the "Device Manager" tab.
7. In the hierarchical display under "Other Devices" is a listing for "PCI Mass Storage Controller." Choose it and then press the "Properties" button.
8. Choose the "Driver" tab in the "Properties" window, choose "Update Driver," and then press "Next."
9. Choose "Search for a better driver than the one your device is using now (recommended)," then press "Next."
10. Choose "Specify Location," and then type "A:\WIN95-98" in the text box.
11. Insert the "FastTrak100 Driver" diskette into the A: drive.
12. Press the "Next" button. A message informing you that Windows has found "Win95-98 Promise FASTTRAK100 (tm) IDE Controller" should appear.
13. Press "Next," then "Finish," then "Yes" when asked if you want to restart your computer. Be sure to remove the diskette from drive A:.

2-3-2 Installing Drivers with Existing Windows 98

The following section details the installation of FastTrak100 drivers on a system that has Windows 98 already installed. If you're installing the FastTrak100 drivers on a system during a Windows 98 installation, see "Installing Drivers During Windows 98 Installation."

1. After installing the FastTrak100 controller card and configuring the hard drives, power up the system and boot Windows.
 2. The "Add New Hardware Wizard" will appear, informing you that it has found a "PCI Mass Storage Controller."
 3. Click on "Next," and from the generated list box, choose "Search for a better driver than the one your device is using now."
 4. Click on "Next," and from the generated choices, choose "Specify a location."
 5. Type "A:\WIN95-98" in the text box that appears.
 6. Insert the "FastTrak100 Driver" diskette in drive A:.
 7. Click on "Next." A message informing you that Windows has found "Win95-98 Promise FASTTRAK100 (tm) IDE Controller" should appear.
 8. Click on "Next," and then on "Finish."
 9. Choose "Yes" when asked if you want to restart your computer. Be sure to eject the diskette from drive A:.
- #### **Confirming Driver Installation in Windows 98**
- To confirm that the driver has been properly loaded in Windows 98, perform the following steps:
1. Choose "Settings" from the "Start" menu.
 2. Choose "Control Panel," and then double-click on the "System" icon.
 3. Choose the "Device Manager" tab, and then click the "+" in front of "SCSI controllers." "Win95-98 Promise FASTTRAK100 (tm) IDE controller" should appear.

2-4 Windows NT 4.x

2-4-1 Installing Drivers During New Windows NT 4.0 Installation

1. Start the system installation by booting from the Windows NT disk:
 - a) Floppy install: boot the system with the Windows NT installation diskettes.
 - b) Floppyless install: boot from floppy and type "WINNT /B". After files have been copied, the system will reboot. On the reboot, press the "F6" key when the message "Setup is in

specting your computer's hardware configuration..." appears.

c) CD-ROM disk install: boot from the CD-ROM disk and press the "F6" key when the message "Setup is inspecting your computer's hardware configuration..." appears.

2. When the "Windows NT Setup" window is generated, press "S" to Specify an Additional Device(s).

3. Press "O" to select "Other" and press the "Enter" key.

4. Insert the Promise Technology driver diskette into drive A: and press the "Enter" key.

5. Choose "WinNT Promise FastTrak100 (tm) Controller" from the list that appears on screen, then press the "Enter" key.

6. The Windows NT Setup screen will appear again saying "Setup will load support for the following mass storage devices:" The list will include "Win2000 Promise FastTrak100 (tm) controller".

NOTE: *If you need to specify any additional devices to be installed, do so at this time. Once all devices are specified, continue to step 6.*

7. From the Windows NT Setup screen, press the Enter key. Setup will now load all device files and then continue the Windows NT installation.

8. After a successful installation, the "SCSI Adapter Setup" box will show that the "WinNT Promise FastTrak100 (tm) Controller" driver has been installed.

2-4-2 Installing Drivers with Existing Windows NT 4.0

WARNING: If you wish to use your current bootable drive with the Windows NT4 operating system on the FastTrak100, perform the steps below while the boot drive is still attached to your existing onboard IDE controller. Do not attach any drives to your FastTrak100 until the steps below are complete.

1. Choose "Settings" from the "Start" menu.

2. Choose "Control Panel" from the "Settings" menu.

3. Double-click on the "SCSI Adapters" icon, which generates the "SCSI Adapters" dialog box.

4. Choose "Drivers," and then press "Add."

5. In the "Install Drivers" dialog box, press "Have Disk..."

6. When the "Install From Disk" appears, insert the "FastTrak100 Driver" diskette in drive A:.

7. Type "A:\NT4" in the text box, then choose "OK."

8. When the "Install Driver" dialog box appears, select "WinNT Promise FastTrak100 (tm) Controller" and then press "OK."

9. When the "Select SCSI Adapter Option" dialog box appears, press "Install."

10. After a successful installation, the "SCSI Adapter Setup" box will show that the "WinNT Promise FastTrak100 (tm) Controller" driver has been installed.

11. Power off your system, and then attach your hard drive(s) to the FastTrak100 controller .

2-5 Linux Driver Installation

FastTrak(v1.05) LINUX Driver Installation [03.JUL.2000]

Adding support for the FastTrak to your Linux system can be achieved using various methods. Each method is presented below, with a brief overview, so that you may choose the one most appropriate for your needs.

Install the Driver into an Existing System - If you are currently running Linux and would like to access drives attached to the FastTrak this is the easiest method. Obtain the loadable module from the boot image, ftrh6x.img. Complete instructions for installation are given below.

Install Linux onto a New System - If you would like to install Red Hat 6.2 onto drives attached to the FastTrak, we have provided a boot diskette that contains the necessary drivers. Using our boot diskette will require issuing some shell commands and rebooting the system once in rescue mode. In addition there are geometric compatibility issues with LILO and some system BIOSes that may prevent booting from drives on the FastTrak. Complete instructions are given below.

SOLVE GEOMETRIC COMPATIBILITY ISSUES

It is recommended that ARRAY defined on FastBuild Utility must be created primary DOS partition (any size) before enable FastTrak Device Driver for LINUX . The instructions for creating primary DOS partition as below :

1. Attach drives to FastTrak and boot system from DOS boot-diskette.

2. Use FastBuild Utility to define ARRAY.

3. On DOS prompt, issue dos commands :

fdisk -- to create primary dos partition

(reboot)

format c:

INSTALL FASTTRAK DRIVER INTO AN EXISTING SYSTEM AND BOOTING FROM MOTHER-BOARD

There are two methods to enable FastTrak Linux Driver into an existing system.

[METHOD 1] Install Module :

Issue command : " insmod ftmod.o " or using RAMDISK to load driver on booting.

The FastTrak Module , ftmod.o , was compiled on Red Hat Linux 6.2 (2.2.14-5.0).

If you would like to install FastTrak Module onto other's Linux Kernel version , Please , issue command : " insmod -f ftmod.o " to insert module .

[METHOD 2] Patch Kernel & Make Kernel :

The following instructions are for a new Linux Kernel image.

1. Make sure you have an unmodified source tree under /usr/src/linux
2. Run the executable file "setpat " . If it is successful.

Please , change the current directory to/usr/src/linux.

And "Make Kernel" as follow :

3. At prompt line [root@localhost linux]#: , issue following command:

```
make (menu)config [Enter]
make dep [Enter]
make clean [Enter]
```

```
make bzImage [Enter]
```

(creates new Linux kernel with the Promise information embedded)

4. Copy the newly compiled kernel into the boot directory :

```
cp /usr/src/linux/arch/i386/boot/bzImage /boot/vmlinuz-ft
```

5. Inform the boot loader about the new kernel to edit /etc/lilo.conf as such :

```
boot=/dev/hda
map=/boot/map
install=/boot/boot.b
prompt
timeout=50
***ADD THIS PART ***
image=/boot/vmlinuz-ft
label=FastTrak
root=/dev/hda1
read-only
*****
```

6. Also, update LILO by typing 'lilo' you should see an asterisk next to the label "FastTrak" indicating that LILO is now aware of the new kernel.

7. Reboot. The Promise Patch will be automatically included in the bootable kernel.

INSTALL LINUX ONTO A NEW SYSTEM AND BOOTING FROM FASTTRAK

The following instructions are for a new RedHat 6.2 Linux boxed package. If your Linux Distribution or Linux Kernel version is different from RedHat 6.2 (2.2.14-5.0). You can make installing diskette according to your Linux Distribution and load FastTrak driver , " insmod -f ftmod.o " , to it .Or you may choose the one most appropriate for your needs by yourself.

NOTE: If you are using a SCSI cd-rom to install RedHat you will be unable to use this method. The SCSI drivers were removed from the boot disk to make room for the driver files. You can install any SCSI drivers as normal, once the cd-rom is detected.

CREATING THE NEW BOOT DISKETTE

1. Make a separate "Boot Diskette" to replace the diskette included in the retail package.
2. From a DOS-based PC or after booting from the DOS boot partition on the same PC, obtain Promise FastTrak Linux file "ftrh62.img" from the Promise website (www.promise.com). Store file on the hard drive of this PC and record the directory where file is saved.
3. Insert the RedHat Installation CD supplied with the retail box.
4. From a DOS command line, execute the boot diskette creation utility as follows:
[CD drive letter]\dosutils\rawrite
5. At next prompt, enter path and filename where the ftrh6x.img file is saved as follows:
[C:\pathname\ftrh62.img]
6. At next prompt, enter target floppy diskette letter (i.e. A:).
7. Insert blank/formatted diskette into floppy drive and Enter. The utility will create a new "Boot Diskette" that includes the Promise driver.
8. When C: prompt returns, the "boot" diskette is ready for installation.
9. Physically install the FastTrak card into the Linux PC.
10. Attach a CD-ROM to onboard motherboard ports .

INSTALLING REDHAT 6.2 USING THE NEW BOOT DISKETTE

11. Insert prepared Promise "Boot Diskette"
12. Boot Linux system, Promise BIOS screen will appear as part of boot
13. At "boot:" prompt, press Enter key, Linux kernel will begin loading
14. When prompted by the FastTrak Setup script, enter "1".
15. At RH Linux main welcome screen, follow installation instructions from

manual

16. Make note of which partition you choose to mount your root directory from inside Disk Druid (ie. /dev/sda5)
17. When prompted "Done" or "Complete", press ALT-F2. This brings you into the currently running command shell, so that you can copy the driver files required by the FastTrak.
18. at the # prompt issue the following commands
#./ft
This shell script copies all the necessary files from the boot disk to the root user's directory.
19. Press ALT-F1 to return to the RedHat install and proceed as normal.
20. Reboot the computer with the boot disk inserted into the floppy drive.
21. At "boot:" prompt enter
"linux(or text) root=/dev/DEV"
where DEV is the partition you want to mount the root directory from (ie. sda5 or sda1 ...)
22. When prompted by the FastTrak Setup script, enter "2".
23. Login to your Linux system as "root"
24. Change the current directory to FastTrak Driver directory under "/root/ft105/" ,and issue command "sh setup-ft". This script creates an initial root disk with the FastTrak driver located on it. It also modifies the lilo configuration file /etc/lilo.conf and reinstalls LILO.
25. Reboot your system without a disk inserted. Your system should boot off the drive attached to the FastTrak normally.

WHERE TO GET FASTTRAK INFORMATION ON LINUX SYSTEM

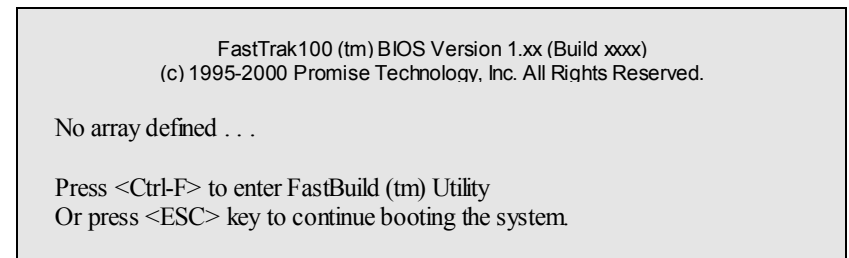
After FastTrak Driver has been installed . It will create a dynamic text file in the directory of " /proc/scsi/fasttrak/ " and report Array/Drive information and rebuilding status if system is rebuilding . Such as Array status , Drive inquiry data , rebuilding percentage , rebuilt spent time

3. FastTrak100 BIOS Utility

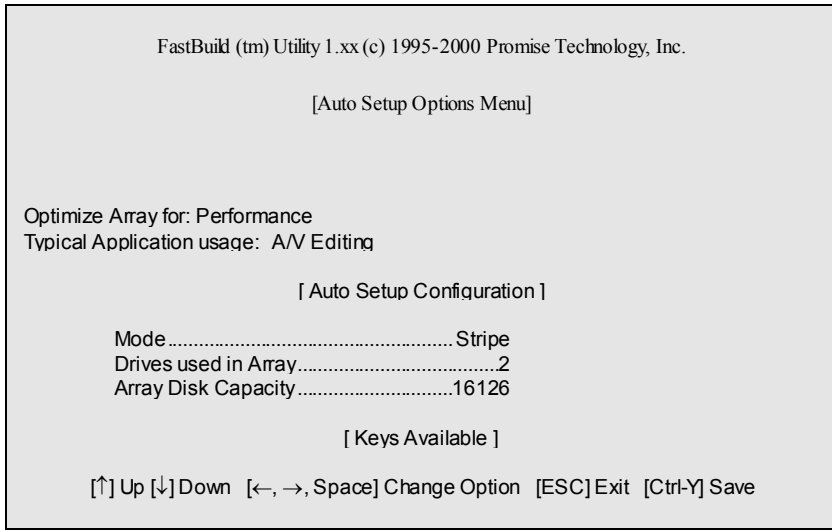
Creating Your Disk Array

You will now use the onboard FastBuild BIOS utility to create your array using the attached drives. There are three different scenarios in creating this array. You can create an array for performance, you can create a Security array using new hard drives (recommended), or you can create a Security array using an existing hard drive and a new hard drive.

1. Boot your system. If this is the first time you have booted with the FastTrak100 card and drives installed, the Promise onboard BIOS will display the following screen.



2. Press <Ctrl-F> keys to display the FastBuild (tm) Utility Main Menu
3. Press "1" to display the Auto Setup Menu below. This is the fastest and easiest method to creating your first array.



NOTE: If you wish to customize certain settings at a later time, you may do so by manually creating your array (see page 70 in Using FastBuild Configuration Utility).

Creating an Array for Performance

NOTE: FastTrak100 allows users to create striped arrays with 1, 2, 3, or 4 drives.

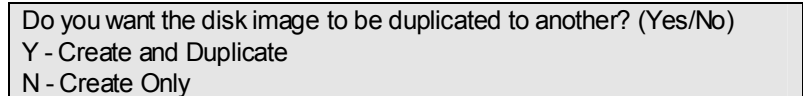
To create an array for best performance, follow these steps:

1. Using the Spacebar, choose "Performance" under the **Optimize Array for** section.
2. Select how you will use your PC most under the **Typical Application usage** section. The choices are A/V Editing, Server, and Desktop (the default).
3. Press <Ctrl-Y> keys to Save and create the array.
4. Reboot your system.
5. Once the array has been created, you will need to FDISK and format the array as if it were a new single hard drive.
6. Proceed to Installing Drivers section of the manual **Creating a Security Array With New Drives**

NOTE: FastTrak100 permits only two drives to be used for a single Mirrored array in Auto Setup. If more drives are physically attached to the card, the Mirroring option will not be available at all in Auto Setup.

To create an array for data protection using new hard drives, follow these steps:

1. Using the Spacebar, choose "Security" under the **Optimize Array for** section.
2. Press <Ctrl-Y> keys to Save your selection.
3. The window below will appear.



4. Press "N" for the Create Only option.

5. A window will appear almost immediately confirming that your Security array has been created. Press any key to reboot the system

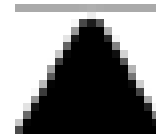
Array has been created.
<Press Any Key to Reboot>

6. Proceed with normal FDISK and format procedures as if you had just installed a new hard drive.
7. Once the arrayed drives have been formatted, proceed to the **Installing Driver** chapter on page xx to install your operating system and/or FastTrak100 driver.

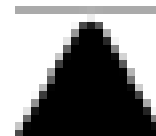
Creating a Security Array With An Existing Data Drive

NOTE: FastTrak100 permits only two drives to be used for a single Mirrored array in Auto Setup. If more drives are physically attached to the card, the Mirroring option will not be available.

You would use this method if you wish to use a drive that already contains data and/or is the bootable system drive in your system. You will need another drive of identical or larger storage capacity.



WARNING: Backup any necessary data before proceeding. Failure to follow this accepted PC practice could result in data loss.



WARNING: If you wish to include your current bootable drive using the Windows NT 4.x or Windows 2000 operating system as part of a bootable Mirrored (RAID 1) array on your FastTrak100, do NOT connect the hard drive to the FastTrak100 controller yet. You MUST install the Windows NT4 or 2000 driver software first (see pagexx) to this drive while it is still attached to your existing hard drive controller. For all other Operating Systems, proceed here.

Follow these steps:

1. Using the Spacebar, choose "Security" under the **Optimize Array for** section.
2. Press <Ctrl-Y> keys to Save your selection. The window below will appear.

Do you want the disk image to be duplicated to another? (Yes/No)
Y - Create and Duplicate
N - Create Only

3. Press "Y" for the Create and Duplicate option. The window below will appear asking you to select the Source drive to use. FastBuild will copy all data from the Source drive to the Target drive.

```

Source Disk
Channel:ID      Drive Model      Capacity (MB)

Target Disk
Channel:ID      Drive Model      Capacity (MB)

[Please Select A Source Disk]
Channel:ID      Drive Model      Capacity (MB)
1 :MasterQUANTUMCR8.4A  8063
2 :MasterQUANTUMCR8.4A  8063

[↑] Up [↓] [ESC] Exit [Ctrl-Y] Save

```

4. Use the arrow keys to choose which drive contains the existing data to be copied.
5. Press [Ctrl-Y] keys to Save selection and start duplication. The following progress screen will appear.

```

Start to duplicate the image . . .
Do you want to continue? (Yes/No)
Y - Continue N - Abort

```

6. Select "Y" to continue. If you choose "N" , you will be returned to step 1.
7. Once complete, the following screen will appear confirming that your Security array has been created. Press any key to reboot the system

```

Array has been created.
<Press Any Key to Reboot>

```

8. Proceed to the **Installing Driver** chapter on page xx to install the FastTrak100 driver and/or operating system.

4. Using FastBuild™ Configuration Utility

The FastBuild™ Configuration Utility offers several menu choices to create and manage the drive array on the Promise FastTrak100 adapter. For purposes of this manual, it is assumed you have already created an array in the previous chapter and now wish to make a change to the array or view other options.

Viewing FastTrak100 BIOS Screen

When you boot your system with the FastTrak100 card and drives installed, the Promise onboard BIOS will detect the drives attached and show the following screen.

```

FastTrak100 (tm) BIOS Version 1.xx (Build xxxx)
(c) 1995-2000 Promise Technology, Inc. All Rights Reserved.

Scanning IDE drives . . . . .

```

If an array exists already, the BIOS will display the following screen showing the card's BIOS version and status of the array.

```

FastTrak100 (tm) BIOS Version 1.xx (Build xxxx)
(c) 1995-2000 Promise Technology, Inc. All Rights Reserved.

ID      MODE SIZETRACK-MAPPING  STATUS
1 *    2+0 Stripe 16126M   611/128/32  Functional

Press <Ctrl-F> to enter FastBuild (tm) Utility....

```

The array status consists of three possible conditions: *Functional*, *Critical*, *Offline*.

Functional - The array is operational.

Critical - A mirrored array contains a drive that has failed or disconnected. The remaining drive member in the array is functional. However, the array has temporarily lost its ability to provide fault tolerance. The user should identify

the failed drive through the FastBuild™ Setup utility, and then replace the problem drive.

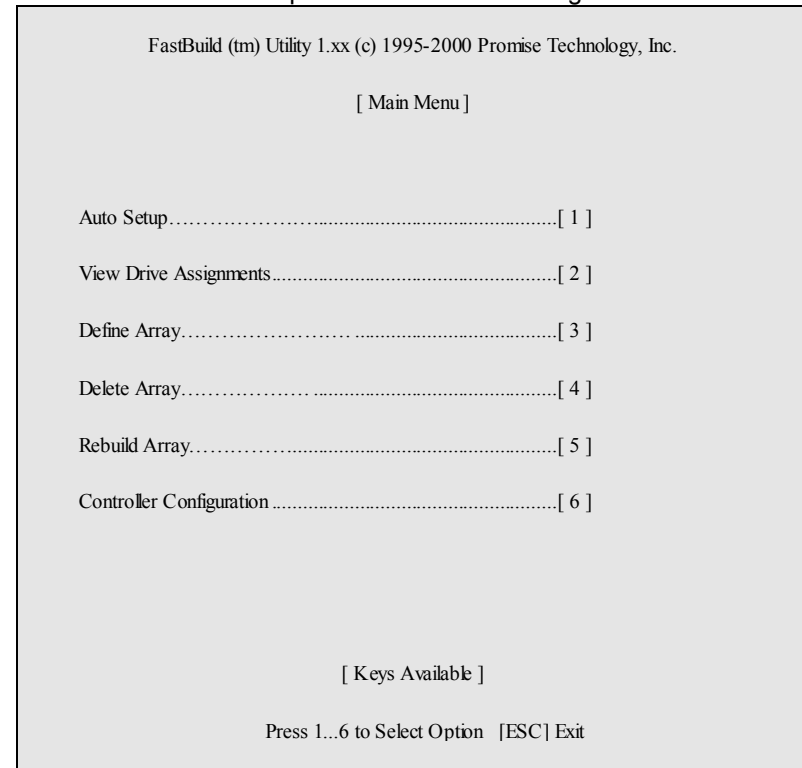
Offline - A mirrored array has 2 drives that have failed/disconnected or a striped array has 1 drive that has failed or been disconnected. When the array condition is “offline,” the user must replace the failed drive(s), then restore data from a backup source.

Navigating the FastBuild™ Setup Menu

When using the menus, these are some of the basic navigation tips: Arrow keys highlights through choices; [Space] bar key allows to cycle through options; [Enter] key selects an option; [ESC] key is used to abort or exit the current menu.

Using the Main Menu

This is the first option screen when entering the FastBuild™ Setup.



To create a new array automatically, follow the steps under “Creating Arrays Automatically” on page 75. Promise recommends this option for most users.

To manually create an array or define an array as bootable, follow the steps under “Manually Creating Arrays” on page 79. You will need to manually create an array if you wish to modify block size.

To view drives assigned to arrays, see “Viewing Drive Assignments” on page 78.

To delete an array (but not delete the data contained on the array), select “Deleting An Array” on page 87.

To rebuild a mirrored array, see “Rebuilding an Array” on page 89.

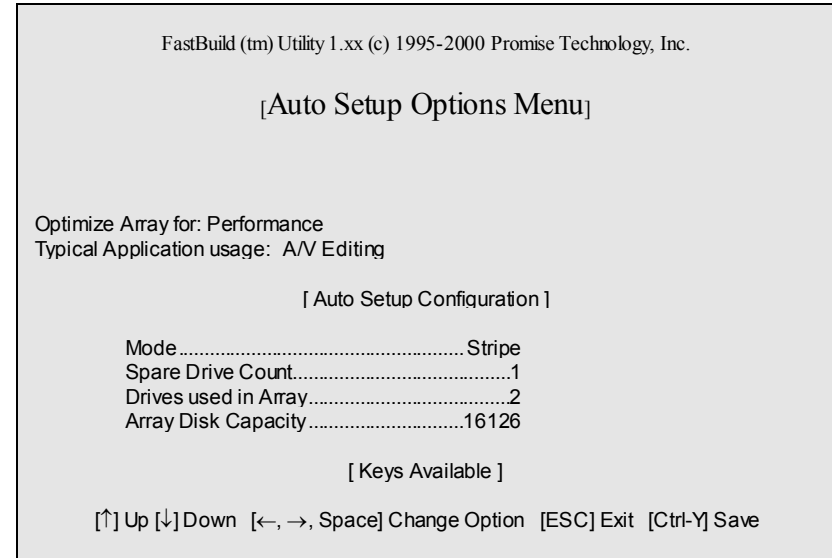
To view controller settings, see “Viewing Controller Configuration” on page 91



NOTE: After installing the FastTrak100 card and configuring an array using FastBuild, you should FDISK and format the arrayed drive(s) if you are using new, blank drives. depending on the type of array you are using.

Creating Arrays Automatically

The Auto Setup <1> selection from the Main Menu can intuitively help create your disk array. It will assign all available drives appropriate for the disk array you are creating. After making all selections, use Ctrl-Y to Save selections. FastBuild will automatically build the array.



Optimize Array For

Select whether you want Performance (RAID 0), Security (RAID 1 or RAID 0+1), or Capacity (Spanning) under the “Optimize Array for” setting.

Performance (RAID 0 Striping)

Supports the maximum performance. The storage capacity equals the number of drives times the capacity of the smallest drive in the disk array.

NOTE: FastTrak100 permits striped arrays using 1, 2, 3, or 4 drives attached in Auto Setup mode.

Security (RAID 1 Mirroring, or RAID 0+1 Striping/Mirroring)

Creates a mirrored (or fault tolerant) array for data security.

***NOTE:** Under the Security setting, FastTrak100 permits two drives to be used for a single Mirrored array or four drives to be used for a Mirrored/Striped array in Auto Setup.*

Capacity (Spanning)

Achieves the maximum amount of capacity by adding the sum of all attached drives. The Stripe Block option does not apply.

Defining Typical Application Usage

Allows the user to choose the type of PC usage that will be performed in order to optimize how FastTrak100 handles data blocks to enhance performance. Your choice will determine the block size used. You may choose from: A/V Editing (for audio/video applications, or any similar application that requires large file transfers), Server (for numerous small file transfers), or Desktop (a combination of large and small file sizes).

Using a “Hot” Spare Drive

If a third drive is attached as a “Slave” and is not assigned to a mirrored two-drive disk array (one optimized for “Security”), it will be recognized as a Spare Drive. Such a drive is immediately used as a “standby” replacement. It is automatically added to an array once a disk member of the array has been detected as “failed.” To restore fault tolerance as quickly as possible, FastTrak100 begins to perform an automatic data rebuild on the “spare” drive in the background without the need to restart the system. At a later time, the failed drive can be physically removed from the FastTrak100 card and an extra drive added in its place to function as the “spare” drive.

Creating Multiple Disk Arrays

1. If you plan to create multiple arrays, attach only the drives necessary to create the first disk array and complete the <1> Auto Setup.
2. Install the additional drives needed for the second array and again use the <1> Auto Setup.

***NOTE:** If you wish to customize the settings of individual disk arrays (such as block size), you must manually create disk arrays with the Define Array <3> option from the Main Menu.*

Viewing Drive Assignments

The View Drive Assignments <2> option in the Main Menu displays whether drives are assigned to a disk arrays or are unassigned.

Under the “Assignment” column, drives are labeled with their assigned disk array or shown as “Free” if unassigned. Such “Free” drives can be used for a future array or used as a spare drive when a drive fails in a mirrored array. Unassigned drives are not accessible by the OS. The menu also displays the data transfer mode that relates to speed used by each drive (U5 refers to 100MB/sec transfers, U4 refers to 66MB/sec transfers, etc...)

```

FastBuild (tm) Utility 1.xx (c) 1995-2000 Promise Technology, Inc.

[ View Drive Assignments ]

Channel:ID Drive Model Capacity(MB) Assignment Mode
1 : Master QUANTUMCR8.4A 8063 Array 1 U5
1 : Slave QUANTUMCR8.4A 8063 Free U5
2 : Master QUANTUMCR8.4A 8063 Array 1 U5

[ Keys Available ]

[↑] Up [↓] Down [ESC] Exit Mode (U=UDMA, P=PIO, D=DMA)
    
```

Manually Creating an Array

The Define Array <3> option from the Main Menu allows users to begin the process of manually defining the drive elements and RAID levels for one or multiple disk arrays attached to FastTrak100. Users will commonly create one or two drive arrays with FastTrak100, though the card will support a maximum of four arrays¹.

NOTE: For most installations, Promise recommends the <1> Auto Setup for easy disk array creation.

```

FastBuild (tm) Utility 1.xx (c) 1995-2000 Promise Technology, Inc.

[Define Array Menu]

Array No RAID Mode Total Drv Capacity(MB) Status
Array 1 Stripe 2 16126 Functional
Array 2 _____
Array 3 _____
Array 4 _____

[ Keys Available ]

Note: * — Bootable Array

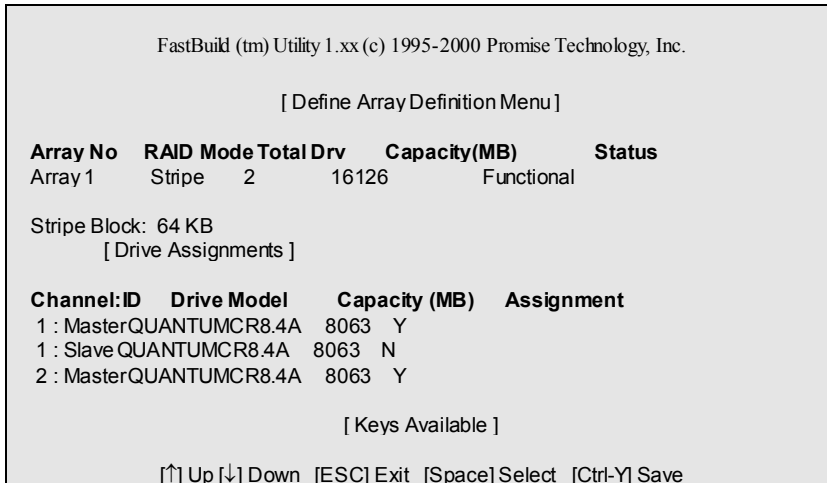
[↑] Up [↓] Down [ESC] Exit [Enter] Select [Space] Change Boot Drive
    
```

1. To manually create an array from the Define Array Menu, use the arrow keys to highlight the array number you wish to define, and press [Enter] to select.
2. The Define Array Definition Menu will next appear that allows drive assignments to the disk array (see next page).

¹ A user may use a single drive in either striping or spanning mode with FastTrak100. In this rare scenario, the card will create an individual array ID but will offer conventional controller performance, depending on the drive type. At a later time, a second drive can be added to the array and the array re-created to support RAID 1 mirroring.

Selecting Array Type

1. Under the Definition section of this menu, highlight the Array # for which you want to assign a RAID level.
2. Use the [Space] key to cycle through three array types: Performance (RAID 0 Striping), Security (RAID 1 Mirroring, RAID 0+1 Striping/Mirroring (for 4 drives), or Capacity (Spanning). See page xx about RAID levels.



Selecting Stripe Block

For RAID 0 Striped arrays only, you may manually select the “stripe block size.” Use the Spacebar to scroll through choices progressing as follows (1, 2, 4, 8, 16 . . . 1024).

The size selected affects how FastTrak100 sends and retrieves data blocks from the drives. You will need to perform your own testing to determine how the data block size is affecting your particular use of the array. In general, a larger block size is better when handling large data transfers (such as in A/V editing or graphics) while a smaller block size is better when handling e-mail and other common server data. The default is 64K.

Assigning Drive(s) to Array

1. Under the [Drive Assignments] section, highlight a drive using the [↑] Up [↓] keys.
2. With the [Space] bar key, change the Assignable option to “Y” to add the drive to the disk array.
3. Press <Ctrl-Y> to save the disk array information. Depending on the array type selected, the following scenarios will take place:

(a) If choosing a Striping, Spanning, or Mirroring/Striping array, the initial Define Array Menu screen will appear with the arrays defined. From there you may ESC to exit and return to the Main Menu of FastBuild.

(b) If you selected a Mirroring array for two drives, there is an additional window that appears as described in order to create the array. To do this you will use either two brand new drives, or one drive that contains existing data that you wish to mirror.

Creating A Mirrored Array Using New Drives

As described in the Drive Assignments Option section above, if you selected a mirroring array and wish to use two new assigned drives, follow the directions here.

1. After assigning new drives to a Mirroring array and saving the information with <Ctrl-Y>, the window below will appear.

Do you want the disk image to be duplicated to another? (Yes/No)
Y - Create and Duplicate
N - Create Only

2. Press “N” for the Create Only option.
3. A window will appear almost immediately confirming that your Security array has been created. Press any key to reboot the system

Array has been created.
<Press Any Key to Reboot>

Adding Fault Tolerance to an Existing Drive

FastTrak100 will create a mirrored array using an existing system drive with data. You must assign the existing drive and another drive of same or larger capacity to the Mirroring array. The BIOS will send the existing data to the new blank drive.



WARNING: Backup any necessary data before proceeding. Failure to follow this accepted PC practice could result in data loss.



WARNING: If you wish to include your current bootable drive using the Windows NT 4.x or Windows 2000 operating system as part of a bootable Mirrored (RAID 1) array on your FastTrak100, do NOT connect the hard drive to the FastTrak100 controller yet. You MUST install the Windows NT4 or 2000 driver software first

(see page xx) to this drive while it is still attached to your existing hard drive controller. For all other Operating Systems, proceed here.

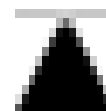
1. After assigning the drives to a Mirroring array, press <Ctrl-Y> keys to Save your selection. The window below will appear.

Do you want the disk image to be duplicated to another? (Yes/No)
 Y - Create and Duplicate
 N - Create Only

2. Press “Y” for the Create and Duplicate option. The window below will appear asking you to select the Source drive to use. FastBuild will copy all data from the Source drive to the Target drive.

| Source Disk | | |
|-------------------------------------|---------------------|---------------|
| Channel:ID | Drive Model | Capacity (MB) |
| Target Disk | | |
| Channel:ID | Drive Model | Capacity (MB) |
| [Please Select A Source Disk] | | |
| Channel:ID | Drive Model | Capacity (MB) |
| 1 : | MasterQUANTUMCR8.4A | 8063 |
| 2 : | MasterQUANTUMCR8.4A | 8063 |
| [↑] Up [↓] [ESC] Exit [Ctrl-Y] Save | | |

3. Use the arrow keys to choose which drive contains the existing data to be copied.



WARNING: All target drive data will be erased. Make sure you choose the correct drive.

4. Press [Ctrl-Y] keys to Save selection and start duplication. The following confirmation screen will appear.

Start to duplicate the image . . .
 Do you want to continue? (Yes/No)
 Y - Continue N - Abort

5. Select “Y” to continue. If you choose “N” , you will be returned to step 1.
6. Once “Y” is selected, the following progress screen will appear. The process will take a few minutes.

Please Wait While Duplicating The Image

100% Complete

7. Once mirroring is complete, the following screen will appear confirming that your Security array has been created. Press any key to reboot the system

Array has been created.
<Press Any Key to Reboot>

Making a FastTrak100 Disk Array Bootable



WARNING: In order for you to boot from an array on the FastTrak100, your PC or server must be configured in the CMOS Setup to use the FastTrak100 as a bootable device (versus the onboard controller or another add-in card). This option is not available if the FastTrak100 is being used as a secondary controller.

1. Once you have returned to the Define Array Menu window (below), you will see the array(s) you have created. You now may use the menu to select which previously-defined array will be used as the bootable array.

```
FastBuild (tm) Utility 1.xx DELL (c) 1995-2000 Promise Technology, Inc.

[ Define Array Menu ]

Array No   RAID Mode  Total Drv  Capacity(MB)  Status
* Array 1   Stripe     2          13044         Functional

Note: * — Bootable Array

[↑] Up [↓] Down [ESC] Exit [Enter] Select [Space] Change Boot Drive
```

2. Highlight the array which you want to boot from using the [↑] Up [↓] Down keys.
3. Press the [Space] bar key.
4. An * asterisk will appear next to the array number indicating it as bootable. The system will now recognize this array as the first array seen
5. The system will then use this bootable array as the (fixed) boot C: drive.

NOTE: The bootable array must contain your configured operating system.

Creating a “Hot” Spare Drive for Mirrored Arrays

For automatic rebuilds of a mirrored array, attach an extra “spare” drive to the FastTrak100. Drives that are not assigned to an array and are the same size or larger than the original will be used for the automatic rebuild. This is performed in the background under all supported operating systems, except DOS. At a later time, the system can be turned off and the failed drive can be physically removed.

How FastTrak100 Orders Arrays

During startup, the disk arrays on the FastTrak100 are recognized in this order: 1) The array set to bootable in the FastBuild™ Setup, and 2) the Array number (i.e. Array 0, Array 1...). This would be involved in determining which drive letters will be assigned to each disk array.

How FastTrak100 Saves Array Information

All disk array data is saved into the reserved sector on each array member. Promise suggests that users record their disk array information for future reference.

Another feature of the FastTrak100 disk array system is to recognize drive members even if drives are moved between different FastTrak100 card connectors. Since each drive’s array data identifies itself to the array, it is possible to move or swap drives without modifying the array setup. This is valuable when adding drives, or during a rebuild.

Deleting An Array

The Delete Array <4> Menu option allows for deletion of disk array assignments. This is not the same as deleting data from the drives themselves. If you delete an array by accident (and before it has been used again), the array can normally be recovered by defining the array identically as the deleted array.

WARNING: *Deleting an existing disk array could result in its data loss. Make sure to record all array information including the array type, the disk members, and stripe block size in case you wish to undo a deletion.*

| Array No | RAID Mode | Total Drv | Capacity(MB) | Status |
|----------|-----------|-----------|--------------|------------|
| Array 1 | Stripe | 2 | 16126 | Functional |
| Array 2 | Mirror 2 | 8063 | Functional | |
| Array 3 | --- | --- | --- | --- |
| Array 4 | --- | --- | --- | --- |

[Keys Available]

[↑] Up [↓] Down [ESC] Exit [Del] Delete

1. To delete an array, highlight the Array you wish to delete and press the [Del] key.

The View Array Definition menu will appear (see below) showing which drives are assigned to this array.

FastBuild (tm) Utility 1.xx (c) 1995-2000 Promise Technology, Inc.

[Define Array Menu]

| Array No | RAID Mode | Total Drv | Capacity(MB) | Status |
|----------|-----------|-----------|--------------|------------|
| Array 1 | Stripe | 2 | 16126 | Functional |

Stripe Block: 64 KB
[Drive Assignments]

| Channel:ID | Drive Model | Capacity (MB) | Assignment |
|------------|---------------|---------------|------------|
| 1 : Master | QUANTUMCR8.4A | 8063 Y | |
| 2 : Master | QUANTUMCR8.4A | 8063 Y | |

2. Confirm yes to the following warning message with the <Ctrl-Y> key to continue array deletion:

Are you sure you want to delete this array?
Press Ctrl-Y to Delete, others to Abort

3. After deleting the array, you should create a new array using Auto Setup or the Define Array menu from the FastBuild Main Menu.

Rebuilding A Mirrored Array

The Rebuild Array <5> Menu option is necessary to recover from an error in a mirrored disk array. You will receive an error message when booting your system from the FastTrak BIOS.

NOTE: Drives **MUST** be replaced if they contain any physical errors.

Follow these steps BEFORE using the Rebuild Array menu option:

1. On bootup, the FastTrak100 Startup BIOS will display an error message identifying which drive has failed.
2. Press <Ctrl-F> keys to enter FastBuild Main Menu.
3. Select submenu Define Array <3>.
4. Select the failed array and identify the Channel and ID of the failed drive.
5. Power off and physically remove the failed drive.
6. Replace the drive with an identical model.
7. Reboot the system and enter the FastBuild Main Menu.
8. Select the <5> Rebuild Array option. The following screen will appear.

FastBuild (tm) Utility 1.xx (c) 1995-2000 Promise Technology, Inc.

[Rebuild Array Menu]

| Array No | RAID Mode | Total Drv | Capacity(MB) | Status |
|----------|-----------|-----------|--------------|--------|
| Array 1 | Stripe | 2 16126 | Functional | |
| Array 2 | Mirror | 2 8063 | Critical | |
| Array 3 | --- | --- | --- | --- |
| Array 4 | --- | --- | --- | --- |

[Keys Available]

[↑] Up [↓] Down [ESC] Exit [Enter] Select

9. Highlight the array whose Status is "Critical".

APPENDIX B. Gigabit Ethernet

1.0 Product Overview

The DP83820 is a PCI 10/100/1000BaseT Media Access Controller, MAC, from National Semiconductor which supports a 33/66MHz, 32/64 bit PCI 2.1/2.2 bus interface. It complies with the emerging 1000 Mbps Ethernet 802.3z specification and supports full duplex operation.

Other features include:

- Maximized PCI efficiency and performance
- Pause Frames
- Checksum Offloading
- Jumbo Frames
- VLAN support

Gigabit Ethernet Twisted-Pair Media System (1000BASE-T)

UTP Cable

The 1000BASE-T system operates over four pairs of Category 5 UTP wires. The maximum segment length is 100meters of UTP cable with a 100 ohm characteristic impedance rating and that meets or exceeds the TIA/EIA Category 5 specifications.

Installing an RJ-45 Plug

Building a patch cable is a process of installing RJ-45 plug connector on each end of a stranded cable. Here we describe the process of installing the RJ-45 connectors.

1. Carefully strip away a few inches of the outer insulation from the twisted-pair cable, revealing the individually insulated twisted-pair conductors inside. Each twisted-pair conductor consists of a set of thin stranded wires surrounded by insulation. Do not cut into the insulation of twisted-pair conductors.
2. Orient the conductors according to the colors of the insulation.
3. Straighten out the twisted-pair conductors, and cut the conductors to a length of about 12mm. Leave the insulation in place on the individual twisted-pair conductors. Make sure that the conductors are all cut to the same length, providing a square end to the cut.
4. If you wish to use the TIA/EIA 568A preferred wiring sequence, then arrange the conductors in the following order from top to

bottom. The wire colors, and the pin numbers to which they connect, are as follows:

- Pin 8: Brown/White
- Pin 7: White/Brown
- Pin 6: Orange/White
- Pin 5: White/Blue
- Pin 4: Blue/White
- Pin 3: White/Orange
- Pin 2: Green/White
- Pin 1: White/Green

If you wish to use the TIA/EIA 568B optional wiring sequence (also known as the AT&T 258A wiring sequence), then arrange the conductors in the following order from top to bottom.

- Pin 8: Brown/White
 - Pin 7: White/Brown
 - Pin 6: Green/White
 - Pin 5: White/Blue
 - Pin 4: Blue/White
 - Pin 3: White/Green
 - Pin 2: Orange/White
 - Pin 1: White/Orange
5. Hold the RJ-45 connector with the bottom (contact side) facing you. The blunt end of the connector (which gets inserted into an RJ-45 jack) should be pointing to the left and the open end of the connector should point to the right. While holding the open connector in this orientation, the pin 8 position is on the top edge, and the pin 1 position is on the bottom edge. Hold the twisted-pair cable firmly in your other hand. Insert the insulated twisted-pair conductors into the connector. Make sure to keep the conductors in the correct sequence.
 6. Slide the conductors all the way into the connector, so that they are firmly seated against the inside front of the connector shell.

Connecting the Network

The third stage in the installation sequence is connecting the Gigabit Ethernet Adapter to the network. In this stage, you will need only the twisted-pair Category 5 network cable. After you have connect one end of the twisted-pair cable to the RJ-45 connector on the Gigabit , and the other end to another PC or a network hub or switch. When connecting the card to another PC, the cable will need to be *crossover only for 10/100Mb speeds*, meaning that pins 1 and 2 must be

swapped with pins 3 and 6, respectively, between the two ends of the cable. A crossover cable should not be used when connecting the Gigabit Ethernet Adapter to a network hub or switch. The difference between a crossover and non-crossover (“straight”) cable is shown the next time you turn on the PC, one of the two green link lights on the Gigabit Ethernet Adapter should become illuminated almost immediately.

This signifies that the card has established link with the device at the other end of the cable and is ready to send and receive data.

2.0 Software Installation

Microsoft Windows NT 4.0 Driver Installation

1. Restart the computer. Boot Windows NT 4.0.
2. Log in as administrator.
3. After the desktop comes up, right-click on the “Network Neighborhood” icon. Choose “Properties” from the menu that comes up. A window entitled “Network” will appear. Click on the fourth tab, “Adapters.” Then click on the “Add...” button.
4. A smaller window entitled “Select Network Adapter” will appear. Click on the “Have Disk...” button.
5. Insert the driver floppy or IEI Drivers CD. If using a driver floppy, type A: in the field at the bottom of the window. If you are using the IEI Drivers CD and want to use the NDIS4 driver, type D:\lan\ns\83820\windows RC2\Win_nt. This assumes that your floppy drive is A: and your CD-ROM drive is D: Use the correct drive letters for your system. Click “OK.”
6. A window entitled “Select OEM Option” will appear, with “National Semiconductor Corp. DP83820 10/100/1000 GigPhyter PCI Adapter” highlighted. Click “OK.”
7. A window will appear entitled “National Semiconductor Corp. DP83820 10/100/1000 GigPhyter PCI Adapter.” This window allows you to choose default settings for the adapter. You can leave the settings as they are and choose “OK.”
8. The “Network” window will reappear with the Gigabit Ethernet Adapter listed under “Network Adapters.” Click “close.”
9. A window will appear entitled “Microsoft TCP/IP properties.” Use this window to set the TCP/IP properties (IP address, sub-net mask, gateway, etc.) for the Gigabit Ethernet Adapter. Click “OK.”
10. The PC will need to be restarted. Windows will prompt you to

restart automatically. Remove all floppy disks and CDs before restarting.

Microsoft Windows 98 / Windows ME Driver Installation

Follow this sequence for installation under Microsoft Windows 98 /Microsoft Windows ME.

1. Restart the computer.
2. During the boot process, a window will appear entitled “Add New Hardware Wizard,” saying that it will complete the installation of the PCI Ethernet Controller. Insert the driver floppy or IEI Drivers CD, then press “Next.”
3. A window will appear presenting you with two options: (1) have Windows locate the driver for you or (2) display all drivers in a specific location so that you can choose one yourself. Choose option (2), then click on “Next.”
4. A window may appear asking you to select the type of device. If this window appears, select “Network Adapters” from the list, then click “Next.”
5. A window will appear entitled “Select Device.” Click on the “Have Disk” button. A window entitled “Install from Disk” will appear. Click on the “Browse” button.
6. If you are using a driver floppy, navigate to the floppy drive, select the file net83820.inf, then click “OK” and proceed to step 6. If you are using the IEI Drivers CD, navigate to the CD-ROM drive, then to the lan/ns/83820/windows RC2/win98(win2k_me) directory, if you wish to use the NDIS 5 driver. Click “OK.”
7. The “Install from Disk” window will reappear. Choose “OK.” The “Select Device” window will then reappear. Again choose “OK.”
8. Windows will begin copying the driver files to the hard disk. If it presents a dialog box saying that it cannot locate DP83820.sys, choose “Browse,” then double-click on DP83820.sys in the directory you navigated to in step 6. When it finishes, it will present a window saying that the driver has been successfully installed. Click on “Finish.”
9. After the driver files have been copied, the machine will need to be restarted. It will prompt you to restart automatically. Remove all floppy disks and CDs before restarting.

Microsoft Windows 2000 Driver Installation

Follow this sequence for installation under Windows 2000.

These instructions were written for Windows 2000.

1. Restart the computer. Boot Windows 2000.
2. Log in as Administrator. Windows 2000 will draw the desktop then bring up a window entitled "Found New Hardware," and another one entitled "Found New Hardware Wizard." If these windows do not appear, double-click on "My Network Places." This should cause them to appear.
3. Bring the "Found New Hardware Wizard" window to the front and click on the "Next" button. The Wizard will then ask if you want it to search for a suitable driver or if you want to choose a driver yourself. Choose the second option, then click the "Next" button.
4. A window subtitled "Hardware Type" may appear. If it does, select "Network Adapters" from the list, then click "Next."
5. After a few seconds, a window subtitled "Select Network Adapter" will appear. Click on the "Have Disk..." button. A smaller window entitled "Install from Disk" will appear.
6. Insert the driver floppy or IEI Drivers CD. If you are using the IEI Drivers CD, click on "Browse," then navigate to the `lan/ns/83820/windows RC2/win2k_me` directory on the CD, if you wish to use the NDIS 5 driver. Click "Open" in the "Locate File" dialog box, then click "OK."
7. A second window subtitled "Select Network Adapter" will appear with "National Semiconductor Corp. DP83820 10/100/1000 Gigabit PCI Adapter" highlighted. Click on "Next."
8. A window subtitled "Start Device Driver Installation" will appear. Click "Next."
9. Windows 2000 may issue a warning that the driver has not been digitally signed by Microsoft. The Gigabit driver will acquire a Microsoft digital signature when it completes WQHL certification. In the meantime, you can ignore this warning.
10. If Windows 2000 brings up a "Files Needed" dialog box saying that the file `DP83820.sys` is needed, navigate to the floppy drive (A:) or the IEI Drivers CD subdirectory from step 6, then click "OK."
11. A window should then appear saying that Windows 2000 has finished installing the Gigabit Ethernet driver. Click "Finish." The PC does not need to be restarted.

LINUX Driver Installation

Follow this sequence for installation under LINUX.

1. To freshly make the driver go to the `/nsc` directory and execute "make"
2. To remove the binaries execute "make clean"
3. If the machine on which the testing is done is an SMP machine, please include the flag `-D__SMP__` in the CFLAGS of the Makefile.
4. After the `dpm.o` (The driver module) is made, to load the driver execute the command "insmod dpm". We can unload the driver by doing "rmmod dpm".
5. After loading the driver, get the interface name(eg: eth0, eth1 etc) for the device. The last line in the messages listed will indicate the name of the interface for the driver. If the message is not coming on the console, we can see the messages in the kernel buffer by executing "dmesg" on the command line. The last line in that will indicate the interface name
6. To configure IP for the interface.
`ifconfig <interface-name> <ip-addr>`
eg: `ifconfig eth0 10.10.10.1`
To shutdown the interface.
`ifconfig <interface-name> down`
eg: `ifconfig eth0 down`
Please note that it may appear to hang on doing an "ifconfig", but it is just momentary and it will soon come out of that. The link becomes active only after about 20 seconds since the "ifconfig".
7. Now we are all set to go with the driver.
8. To make the driver load when the system boots up, the following lines needs to be put in any of the startup scripts like `/etc/rc.d/rc.local` or `/etc/rc.d/init.d/network`
`/sbin/insmod /working/oct1/dpm.o`
`/sbin/ifconfig <interface-name> <ip-addr>`
9. The tunable parameters of the driver like the Receive and Transmit buffers are put in the file `nsm.h` under the heading "Tunable parameters". Right now the value of `RX_QUEUE_SZ` is 100, on a high end system putting a value of 200 for `RX_QUEUE_SZ` can give better performance.
10. To try jumbo frames, the mtu size can be increased using the `ifconfig` utility, as follows
`ifconfig <interface-name> mtu <mtu-size>`
eg: `ifconfig eth0 mtu 3000`

The BUF_SIZE_MAX value in nsm.h (Tunable parameter) should be changed to 4096.
 <mtu-size> can be increased upto 4000 bytes for sane operation.

Appendix C. Address Mapping

IO Address Map

| I/O address Range | Description |
|-------------------|---|
| 000-01F | DMA Controller #1 |
| 020-021 | Interrupt Controller #1, Master |
| 040-05F | 8254 timer |
| 060-06F | 8042 (Keyboard Controller) |
| 070-07F | Real time Clock, NMI Mask |
| 080-09F | DMA Page Register |
| 0A0-0BF | Interrupt Controller #2 |
| 0C0-0DF | DMA Controller #2 |
| 0F0 | Clear Math Coprocessor Busy |
| 0F1 | Reset Math Coprocessor |
| 0F2 | Core logic programming configuration |
| 0F8-0FF | Math Coprocessor |
| 1F0-1F8 | Fixed Disk |
| 200-207 | Game I/O |
| 278-27F | Parallel Printer Port 2 (LPT3) |
| 2E8-2EF | Serial Port 4 |
| 2F8-2FF | Serial Port 2 |
| 300-31F | Prototype Card |
| 360-36F | Reserved |
| 378-37F | Parallel Printer Port 1 (LPT2) |
| 3B0-3BF | Monochrome Display and Printer Adapter (LPT1) |
| 3C0-3CF | Reserved |
| 3D0-3DF | Color/Graphics Monitor Adapter |
| 3E8-3EF | Serial Port 3 |
| 3F0-3F7 | Diskette Controller |
| 3F8-3FF | Serial Port 1 |

1st MB Memory Address Map

| Memory address | Description |
|----------------|---------------|
| 00000-9FFFF | System memory |
| A0000-BFFFF | VGA buffer |
| C0000-C7FFF | VGA BIOS |
| C8000-CFFFF | RAID IDE BIOS |
| F0000-FFFFF | System BIOS |
| 1000000- | Extend BIOS |

*Default setting

IRQ Mapping Table

| | | | |
|------|---------------------------|-------|---------------|
| IRQ0 | System Timer | IRQ8 | RTC clock |
| IRQ1 | Keyboard | IRQ9 | Available |
| IRQ2 | Cascade to IRQ Controller | IRQ10 | Available |
| IRQ3 | COM2 | IRQ11 | Available |
| IRQ4 | COM1 | IRQ12 | PS2 mouse |
| IRQ5 | Available | IRQ13 | FPU |
| IRQ6 | FDC | IRQ14 | Primary IDE |
| IRQ7 | Printer | IRQ15 | Secondary IDE |

DMA Channel Assignments

| Channel | Function |
|---------|--------------------------------|
| 0 | Available |
| 1 | Available |
| 2 | Floppy disk (8-bit transfer) |
| 3 | Available |
| 4 | Cascade for DMA controller 1 |
| 5 | Available |
| 6 | Available |
| 7 | Available |

Appendix D. How to use Wake-Up Function

The MB-3792/3792G provides two kind of Wake Up Function. This page describes how to use Modem Wake-Up and LAN Wake-Up function(PS: Giagbit Ethernet can not support).

Wake-Up By Modem Ring On:

The ATX power supply will be switched on when there is a ring signal detected on pin "RI" of serial port.

Wake-Up On LAN:

When your computer is in power-down status, you can see LAN Link/Active LED is flashing. This status indicates that the LAN chip has entered standby mode and waits for Wake-Up signal. You can use other computers to wake up your computer by sending ID to it.

ID: ID is the address of your system LAN. Every LAN chip has a factory-set ID which you can find it from network information in WINDOWS.

ID's format is xx-xx-xx-xx-xx-xx

Example ID: 00905C21D4