FCC Compliance Statement:

This equipment has been tested and found to comply with limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in residential installations. This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television equipment reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

-Reorient or relocate the receiving antenna

-Move the equipment away from the receiver

-Plug the equipment into an outlet on a circuit different from that to which the receiver is connected

-Consult the dealer or an experienced radio/television technician for additional suggestions

You are cautioned that any change or modifications to the equipment not expressly approve by the party responsible for compliance could void Your authority to operate such equipment.

This device complies with Part 15 of the FCC Rules. Operation is subjected to the following two conditions 1) this device may not cause harmful interference and 2) this device must accept any interference received, including interference that may cause undesired operation.

Declaration of Conformity

We, Manufacturer/Importer
(full address)

G.B.T. Technology Träding GMbH
Ausschlager Weg 41, 1F, 20537 Hamburg, Germany

declare that the product
(description of the apparatus, system, installation to which it refers)

Mother Board
GA-6RXDW

is in conformity with
(reference to the specification under which conformity is declared)
in accordance with 89/336 EEC-EMC Directive

☐ **EN 55011**	Limits and methods of measurement of radio disturbance characteristics of industrial, scientific and medical (ISM high frequency equipment	☐ **EN 61000-3-2*** ☒ **EN60555-2**	Disturbances in supply systems caused by household appliances and similar electrical equipment "Harmonics"
☐ **EN55013**	Limits and methods of measurement of radio disturbance characteristics of broadcast receivers and associated equipment	☐ **EN61000-3-3*** ☒ **EN60555-3**	Disturbances in supply systems caused by household appliances and similar electrical equipment "Voltage fluctuations"
☐ **EN 55014**	Limits and methods of measurement of radio disturbance characteristics of household electrical appliances, portable tools and similar electrical apparatus	☒ **EN 50081-1**	Generic emission standard Part 1: Residual, commercial and light industry
		☒ **EN 50082-1**	Generic immunity standard Part 1: Residual, commercial and light industry
☐ **EN 55015**	Limits and methods of measurement of radio disturbance characteristics of fluorescent lamps and luminaries	☐ **EN 55081-2**	Generic emission standard Part 2: Industrial environment
☐ **EN 55020**	Immunity from radio interference of broadcast receivers and associated equipment	☐ **EN 55082-2**	Generic immunity standard Part 2: Industrial environment
☒ **EN 55022**	Limits and methods of measurement of radio disturbance characteristics of information technology equipment	☐ **ENV 55104**	Immunity requirements for household appliances tools and similar apparatus
☐ **DIN VDE 0855** ☐ **part 10** ☐ **part 12**	Cabled distribution systems; Equipment for receiving and/or **distribution** from sound and television signals	☐ **EN 50091- 2**	EMC requirements for uninterruptible power systems (UPS)

☒ **CE marking** $C\epsilon$ (EC conformity marking)

The manufacturer also declares the conformity of above mentioned product
with the actual required safety standards in accordance with LVD 73/23 EEC

☐ **EN 60065**	Safety requirements for mains operated electronic and related apparatus for household and similar general use	☐ **EN 60950**	Safety for information technology equipment including electrical business equipment
☐ **EN 60335**	Safety of household and similar electrical appliances	☐ **EN 50091-1**	General and Safety requirements for uninterruptible power systems (UPS)

Manufacturer/Importer

(Stamp)

Date :   Apr. 27, 2001

Signature : *Rex Lin*

Name :   Rex Lin

6RXDW

Dual Socket 370 Processor Motherboard

USER'S MANUAL

How This Manual Is Organized

This manual is divided into the following sections:

1) Revision List	Manual revision information
2) Item Checklist	Product item list
3) Features	Product information & specification
4) Installation Guide	Instructions on CPU & Memory Installation
5) Performance & Block Diagram	Product performance & block diagram
6) Dual BIOS	Dual BIOS installation
7) @BIOS™ & EasyTuneⅢ™	@BIOS™ & EasyTuneⅢ™ introduction
8) BIOS Setup	Instructions on setting up the BIOS software
9) Technical Support/RMA Sheet	Document equipment used for after sales service
10) Appendix	General reference

Table Of Content

Revision History

Revision	Revision Note	Date
1.0	Initial release of the 6RXDW motherboard user's manual.	Apr. 2001

The author assumes no responsibility for any errors or omissions that may appear in this document nor does the author make a commitment to update the information contained herein. Third-party brands and names are the property of their respective owners.

Apr. 26, 2001 Taipei, Taiwan, R.O.C

Item Checklist

- ☑ The 6RXDW Motherboard
- ☑ Cable for IDE / Floppy device
- ☑ CD (TUCD) for motherboard utilities
- ☑ 6RXDW User's Manual
- ☑ Diskettes for Promise driver

Features Summary

Form factor	•	30.6 cm x 24.8 cm ATX size form factor, 6 layers PCB.
CPU	•	Dual Socket 370 processor
		Intel Pentium® !!! 100/133MHz FSB, FC-PGA
		(Please make sure your CPU is mass production version)
	•	L2 cache depend on CPU
Chipset	•	VT8633 (Apollo Pro266)
	•	VT8233
Clock Generator		ICS 9248-151
	•	66/100/133 MHz system bus speeds
	•	118/124/140/145/150 MHz system bus speeds
		(reserved)
		ICS 93718
	•	differential clock for DDR bus
Memory	•	4 184-pin DDR DIMM sockets
	•	Supports PC1600 DDR or PC2100 DDR SDRAM
	•	Supports up to 4GB DRAM (Max)
	•	Supports only 2.5V DDR SDRAM
	•	Optional bank-by-bank ECC for DRAM integrity
I/O Control	•	ITE IT8705 F
Slots	•	1 Universal AGP Pro slot 4X/2X (1.5V/3.3V) device
		support
	•	5 PCI slots support 33MHz & PCI 2.2 compliant
	•	1 CNR (Communication and Networking Riser) Slot
On-Board Peripherals	•	1 Floppy port supports 2 FDD with 360K, 720K, 1.2M, 1.44M and 2.88M bytes
	•	1 Parallel port supports Normal/EPP/ECP mode
	•	2 Serial ports (COM A & COM B)
	•	6 USB ports (Back USB*2, Front USB*2, USB AGP*1, USB CNR*1)
	•	1 IrDA connector for IR/CIR
	•	1 Smart Card Reader Header (SCR) [Optional]
On-Board IDE	•	IDE 1and IDE 2 Supports PIO mode 3, 4 UDMA 33 / ATA 66 / ATA100 IDE & ATAPI CD-ROM
	•	IDE 3 and IDE 4 Compatible with RAID, Ultra ATA100, Ultra ATA66, Ultra ATA33, EIDE
	•	4 IDE bus master IDE ports for up to 8 ATAPI devices

To be continued…

3

On-Board RAID	• Support data striping (RAID 0) or mirroring (RAID 1), striping/mirroring (RAID 0+1) or spanning (JBOD) operation. • Supports concurrent dual IDE controller operation. • Supports IDE bus master operation. • Displays status and error checking messages during boot-up. • Mirroring supports automatic background rebuilds • Features LBA and Extended Interrupt13 drive translation in controller onboard BIOS.
Hardware Monitor	• CPU/Power Fan Revolution detect • CPU temperature detect • System Voltage Detect • Chassis Intrusion Detect • Display Actual Current Voltage • CPU overheat warning detect • Voltage detect • Fan fail alarm
On-Board Sound	• AC'97 CODEC • Line In/Line Out/Mic In/AUX In/CD In/TEL/Game Port
PS/2 Connector	• PS/2® Keyboard interface and PS/2® Mouse interface
BIOS	• Licensed AMI BIOS, 2M bit Flash ROM • Support Dual BIOS (Optional)
Additional Features	• Internal/External Modem wake up • Wake On LAN • System after AC back • Poly fuse for keyboard, USB, game port over- current protection • USB KB/MS wake up from S5 • Support @BIOS™ and EasyTuneIII™

6RXDW Motherboard Layout
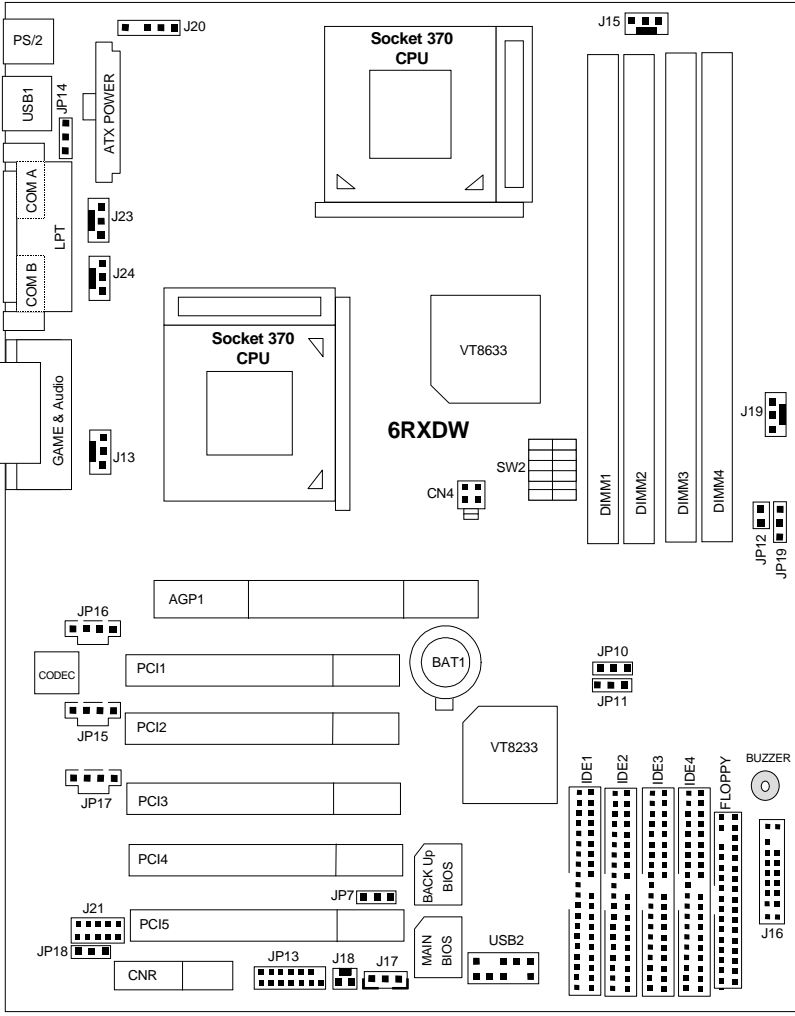
Installation Guide

Getting Started

WARNING!
Computer motherboards and expansion cards contain very delicate Integrated Circuit (IC) chips. To protect them against damage from static electricity, you should follow some precautions whenever you work on your computer.

1. Unplug your computer when working on the inside.
2. Use a grounded wrist strap before handling computer components. If you do not have one, touch both of your hands to a safely grounded object or to a metal object, such as the power supply case.
3. Hold components by the edges and try not touch the IC chips, leads or connectors, or other components.
4. Place components on a grounded antistatic pad or on the bag that came with the components whenever the components are separated from the system.
5. Ensure that the ATX power supply is switched off before you plug in or remove the ATX power connector on the motherboard.

Installing the motherboard to the chassis…

If the motherboard has mounting holes, but they don't line up with the holes on the base and there are no slots to attach the spacers, do not become alarmed you can still attach the spacers to the mounting holes. Just cut the bottom portion of the spacers (the spacer may be a little hard to cut off, so be careful of your hands). In this way you can still attach the motherboard to the base without worrying about short circuits. Sometimes you may need to use the plastic springs to isolate the screw from the motherboard PCB surface, because the circuit wire may be near by the hole. Be careful, don't let the screw contact any printed circuit write or parts on the PCB that are near the fixing hole, otherwise it may damage the board or cause board malfunctioning.

To set up your computer, you must complete the following steps:

- Step 1 - Set system jumpers
- Step 2- Install the Central Processing Unit (CPU)
- Step 3-Install memory modules
- Step 4-Install expansion cards
- Step 5-Connect ribbon cables, cabinet wires, and power supply
- Step 6-Set up BIOS software
- Step 7-Install supporting software tools
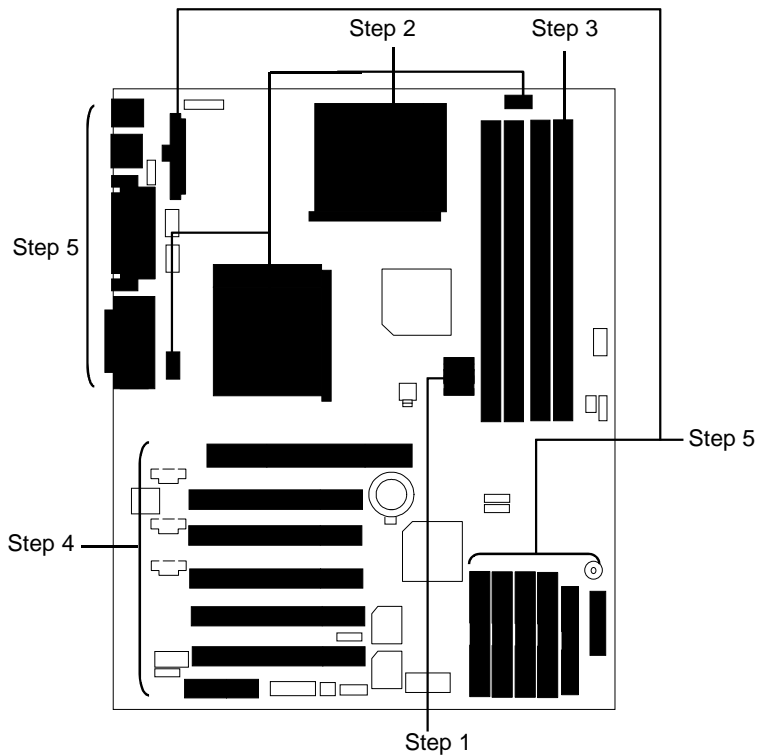
CPU Speed Setup

The system bus frequency can be switched at 66MHz - 133MHz and Auto by adjusting SW 2. (The frequency ratio depend on CPU).

SW2 Select the System Speed at 66MHz - 133MHz and Auto.   O: ON, X: OFF

CPU	1	2	3	4	5	6
Auto	X	X	X	X	O	O
66MHz	O	O	X	X	X	X
100MHz	X	O	X	X	X	X
118MHz	O	X	X	X	X	X
124MHz	X	X	O	X	X	X
130MHz	O	X	O	X	X	X
133MHz	X	X	X	X	X	X
136MHz	X	O	O	X	X	X
140MHz	O	O	O	X	X	X
145MHz	X	X	X	O	X	X
150MHz	O	X	X	O	X	X

✳**We recommend you to setup your system speed to Auto.**

CPU Installation

Please make sure the CPU type and speed is supported by your motherboard.

CPU Top View

CPU Bottom View

Socket Actuation Lever
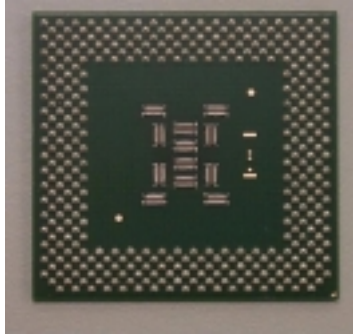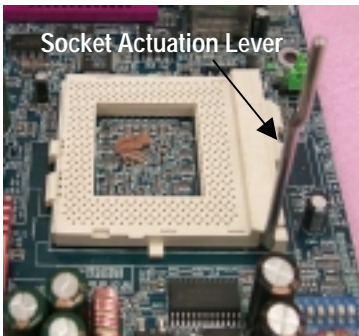
1.Pull the lever out and lift it up.
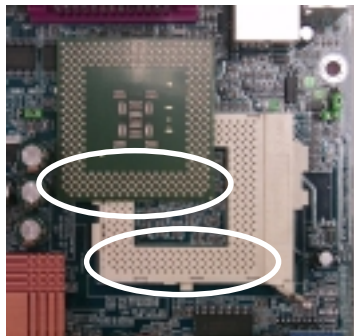
2.The notched corner should point toward the end of the lever. The CPU will only fit in the orientation as shown.

CPU Heat Sink Installation:

Beware: Please check that the heat sink is in good contact with the CPU before you turn on your system. **Poor contact will cause over heat with might cause damage to your processor!**

3.Align CPU and insert it

(Please refer to your heatsink installation manual for application of thermal grease to provide better heat conduction between your CPU and heatsink.)

4.Use compliant fan approved by Intel.
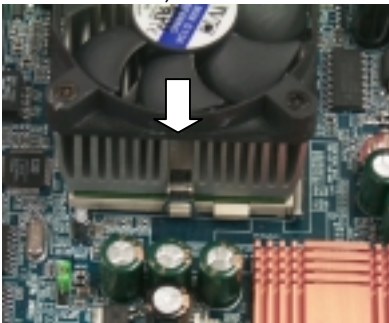
5.Hook one end of the cooler bracket to the CPU socket.

6. Hook the other end of the cooler bracket to the CPU socket.

 (Please refer to the cooler's installation manual for detailed installation steps)
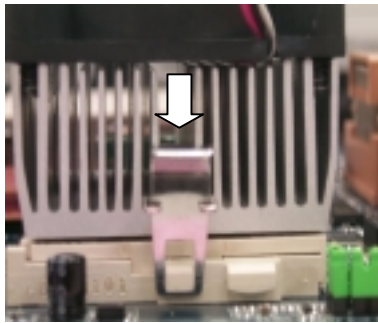
Memory Installation

The motherboard has 4 dual inline memory module (DIMM) sockets. The BIOS will automatically detects memory type and size. To install the memory module, just push it vertically into the DIMM Slot .The DIMM module can only fit in one direction due to the notch. Memory size can vary between sockets.

Total Memory Sizes With Registered DDR DIMM

Devices used on DIMM	1 DIMM x64/x72	2 DIMMs x64/x72	3 DIMMs x64/x72	4 DIMMs x64/x72
64 Mbit (4Mx4x4 banks)	256 MBytes	512 MBytes	768 MBytes	1 GBytes
64 Mbit (2Mx8x4 banks)	128 MBytes	256 MBytes	384 MBytes	512 MBytes
64 Mbit (1Mx16x4 banks)	64 MBytes	128 MBytes	192 MBytes	256 MBytes
128 Mbit (8Mx4x4 banks)	512 MBytes	1 GBytes	1.5 GBytes	2 GBytes
128 Mbit (4Mx8x4 banks)	256 MBytes	512 MBytes	768 MBytes	1 GBytes
128 Mbit (2Mx16x4 banks)	128 MBytes	256 MBytes	384 MBytes	512 MBytes
256 Mbit (16Mx4x4 banks)	1 GBytes	2 GBytes	3 GBytes	4 GBytes
256 Mbit (8Mx8x4 banks)	512 MBytes	1 GBytes	1.5 GBytes	2 GBytes
256 Mbit (4Mx16x4 banks)	256 MBytes	512 MBytes	768 MBytes	1 GBytes
512 Mbit (16Mx8x4 banks)	1 GBytes	2 GBytes	3 GBytes	4 GBytes
512 Mbit (8Mx16x4 banks)	512 MBytes	1 GBytes	1.5 GBytes	2 GBytes

Total Memory Sizes With Unbuffered DDR DIMM

Devices used on DIMM	1 DIMM x64/x72	2 DIMMs x64/x72	3 DIMMs x64/x72	4 DIMMs x64/x72
64 Mbit (2Mx8x4 banks)	128 MBytes	256 MBytes	384 MBytes	512 MBytes
64 Mbit (1Mx16x4 banks)	64 MBytes	128 MBytes	192 MBytes	256 MBytes
128 Mbit (4Mx8x4 banks)	256 MBytes	512 MBytes	768 MBytes	1 GBytes
128 Mbit (2Mx16x4 banks)	128 MBytes	256 MBytes	384 MBytes	512 MBytes
256 Mbit (8Mx8x4 banks)	512 MBytes	1 GBytes	1.5 GBytes	2 GBytes
256 Mbit (4Mx16x4 banks)	256 MBytes	512 MBytes	768 MBytes	1 GBytes
512 Mbit (16Mx8x4 banks)	1 GBytes	2 GBytes	3 GBytes	4 GBytes
512 Mbit (8Mx16x4 banks)	512 MBytes	1 GBytes	1.5 GBytes	2 GBytes

DDR
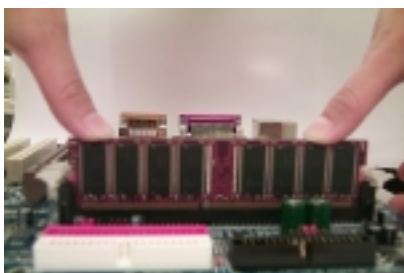
1. The DIMM slot has a notch, so the DIMM memory module can only fit in one direction.
2. Insert the DIMM memory module vertically into the DIMM slot. Then push it down.
3. Close the plastic clip at both edges of the DIMM slots to lock the DIMM module.

Reverse the installation steps when you wish to remove the DIMM module.

DDR Introduction

Established on the existing SDRAM industry infrastructure, DDR (Double Data Rate) memory is a high performance and cost-effective solution that allows easy adoption for memory vendors, OEMs and system integrators.

DDR memory is a sensible evolutionary solution for the PC industry that builds on the existing SDRAM infrastructure, yet makes awesome advances in solving the system performance bottleneck by doubling the memory bandwidth. DDR SDRAM will offer a superior solution and migration path from existing SDRAM designs due to its availability, pricing and overall market support. PC2100 DDR memory (DDR266) doubles the data rate through reading and writing at both the rising and falling edge of the clock, achieving data bandwidth 2X greater than PC133 when running with the same DRAM clock frequency. With peak bandwidth of 2.1GB per second, DDR memory enables system OEMs to build high performance and low latency DRAM subsystems that are suitable for servers, workstations, high-end PC's and value desktop SMA systems. With a core voltage of only 2.5 Volts compared to conventional SDRAM's 3.3 volts, DDR memory is a compelling solution for small form factor desktops and notebook applications.

Connectors

ATX Power

Pin No.	Definition
3,5,7,13,15-17	GND
1,2,11	3.3V
4,6,19,20	VCC
10	+12V
12	-12V
18	-5V
8	Power Good
9	5V SB (stand by+5V)
14	PS-ON(Soft On/Off)

Please note:
AC power cord should only be inserted to your power supply unit after ATX power cable and other related devices are firmly connected to the mainboard.

COM A / COM B / LPT Port

LPT Port

COM A   COM B

Please note:
This mainboard supports 2 standard COM ports and 1 LPT port. Device like printer can be connected to LPT port ; mouse and modem etc can be connected to COM ports.

CN1: PS/2 Keyboard & PS/2 Mouse Connector

PS/2 Mouse

6   5

4   3

2   1
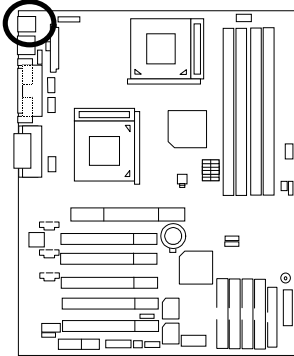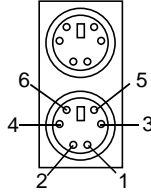
PS/2 Keyboard

PS/2 Mouse/ Keyboard	
Pin No.	Definition
1	Data
2	NC
3	GND
4	Power
5	Clock
6	NC

Please note:
This mainboard supports standard PS/2 keyboard and PS/2 mouse interface connector.

USB1: USB Connector

5 6 7 8

1 2 3 4
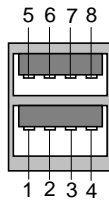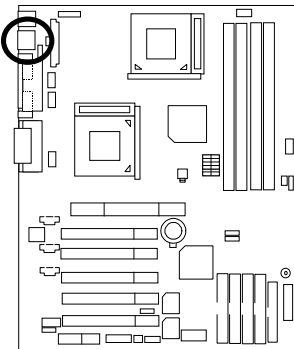
Pin No.	Definition
1	USB Power
2	USB D0-
3	USB D0+
4	GND
5	USB Power
6	USB D1-
7	USB D1+
8	GND

Please note:
Before you connect your device(s) into USB connector(s), please make sure your device(s) has a standard USB interface like, USB keyboard, mouse, scanner, zip, speaker… Also make sure your OS supports USB controller (Win 95 w/ USB supperment, Win98, Windows 2000, Windows ME, Win NT w/ SP 6). If your OS does not support USB controller, please contact OS vendor for passible patch or driver upgrade. For more information please contact your OS or device(s) vendors.

USB2: Front USB Connector
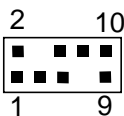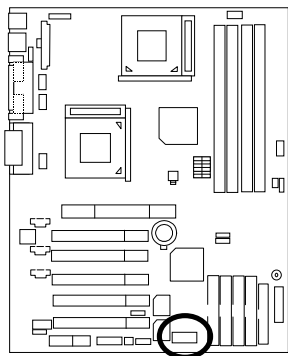
Pin No.	Definition
1	POWER
2	GND
3	USB D2-
4	NC
5	USB D2+
6	USB D3+
7	NC
8	USB D3-
9	GND
10	POWER

Please note:
Be careful with the polarity of the front panel USB connector. Check the pin assignment while you connect the front panel USB cable. Please contact your nearest dealer for optional front panel USB cable.

Floppy Port
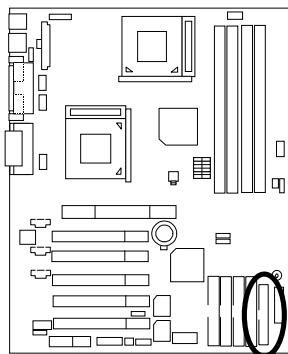
RED LINE
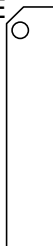
Please note:
Remove the smart card reader cable before you plug Floppy B, you cannot use Floppy B and smart card reader simultaneously.

Game & Audio Port

Game Port

Line Out 1   MIC In
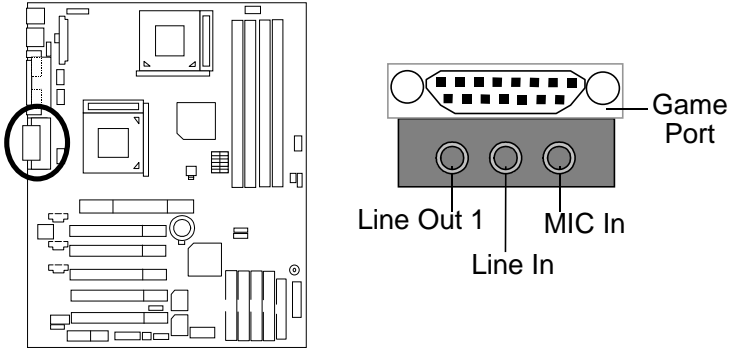
Line In

⚠ **Please note:**
This motherboard supports standard audio port and game port. After install onboard audio driver. you may connector speaker to line out jack, micro phone to MIC in jack Device like CD-ROM , walkman etc can be connected to line-in jack.

IDE1, IDE2 (Primary/Secondary),

IDE3/IDE4 (RAID/ATA100) Port (Optional)

RED LINE

IDE 1   IDE 2   IDE 3   IDE 4
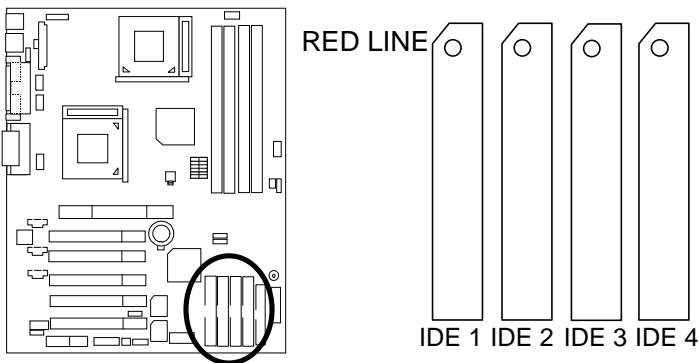
JP16: CD Audio Line In
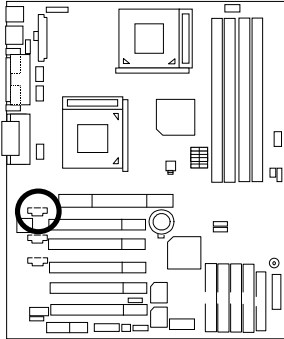
Pin No.	Definition
1	CD-L
2	GND
3	GND
4	CD-R

JP15: AUX_IN
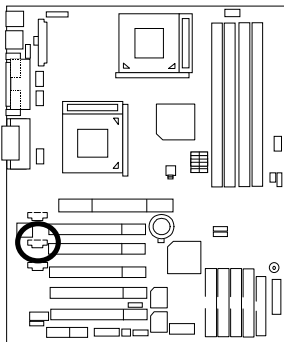
Pin No.	Definition
1	AUX-L
2	GND
3	GND
4	AUX-R

JP17: TEL (The connector is for internal modem card with voice connector)

1 ▢ ▪ ▪ ▪ ▢
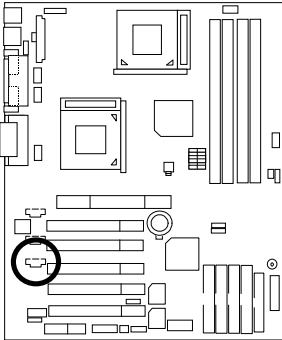
Pin No.	Definition
1	Signal-In
2	GND
3	GND
4	Signal-Out

J18: Ring Power On

1

▢ ▪ ▪ ▢
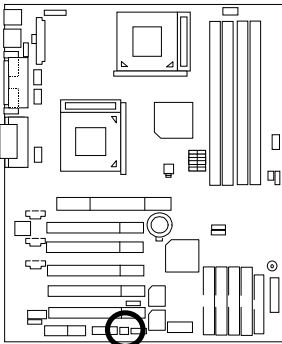
Pin No.	Definition
1	Signal
2	GND

J20: External SMBUS Device Connector

1 ▪ ▪▪▪
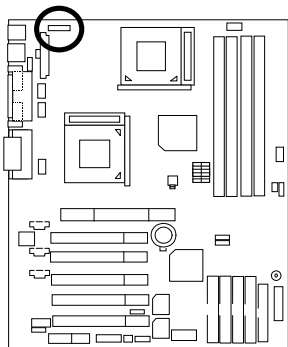
Pin No.	Definition
1	SMB CLK
2	NC
3	GND
4	SMB DATA
5	+5V

J19: System FAN

1
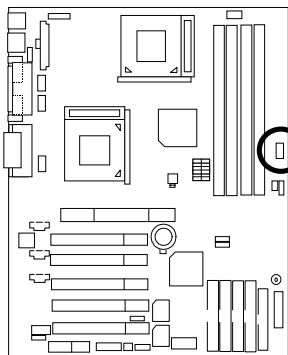
Pin No.	Definition
1	Control
2	+12V
3	NC

J23: Power FAN 1
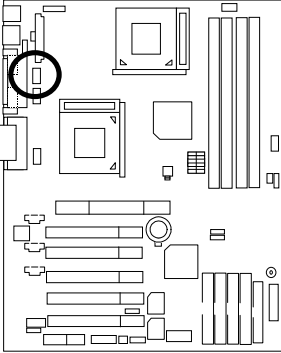
Pin No.	Definition
1	Control
2	+12V
3	SENSE

J24: Power FAN 2
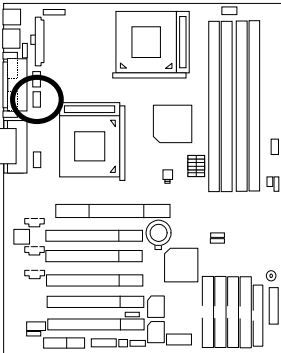
Pin No.	Definition
1	Control
2	+12V
3	SENSE

J13: CPU FAN 1
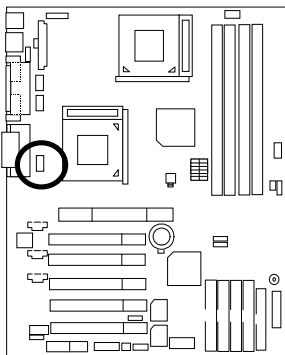
Pin No.	Definition
1	Control
2	+12V
3	SENSE

Please note:
A proper installation of the CPU cooler is essential to prevent the CPU from running under abnormal condition or damaged by overheating.

J15: CPU FAN 2
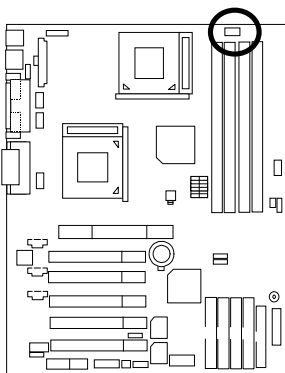
Pin No.	Definition
1	Control
2	+12V
3	SENSE

Please note:
A proper installation of the CPU cooler is essential to prevent the CPU from running under abnormal condition or damaged by overheating.

CN4: ATX +12V Power Connector
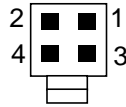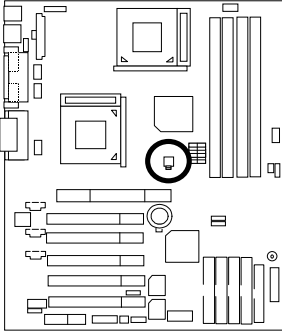
Pin No.	Definition
1	GND
2	GND
3	+12V
4	+12V

Please note:
This connector (ATX +12V) is only for heavy loading AGPPRO card (+12V power consumption above 12A).

J17: Wake on LAN (WOL)
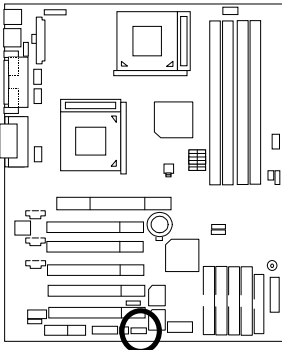
Pin No.	Definition
1	+5V SB
2	GND
3	Signal

J21: IR/CIR
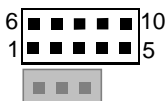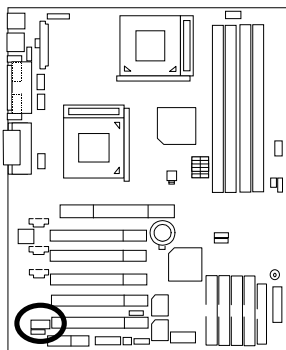
Pin No.	Definition
1	VCC
2	NC
3	IRRX
4	GND
5	IRTX
6	NC
7	CIRRX
8	VCC
9	NC
10	CIRTX

Please note:
Make sure the pin 1 on the IR device is align with pin one the connector. To enable the IR/CIR function on the board, you are required to purchase an option IR/CIR module. For detail information please contact your autherized Giga-Byte distributor. To use IR function only, please connect IR module to Pin1 to Pin5.

JP13: SCR: Smart Card Reader Header (Optional)
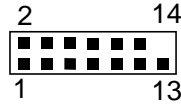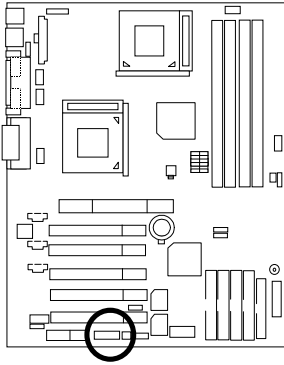
Pin No.	Definition
1	VCC
2	NC
3	NC
4	NC
5	DATA
6	DATA
7	Clock
8	NC
9	NC
10	DATA
11	GND
12	DATA
13	NC
14	NC

Please note:
This MB supports smart card reader. To enable smart card reader function an optional smart card reader box is required. Please contact your autherized distributor.
Remove Floppy B before you plug smart card reader cable, you can not use smart card reader and Floppy B simultaneously.

Panel And Jumper Definition

J16: For 2X11 Pins Jumper
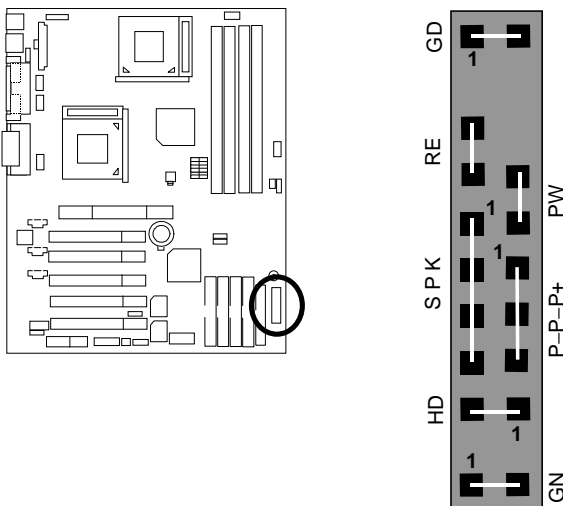
GN (Green Switch)	Open: Normal Operation
	Close: Entering Green Mode
GD (Green LED)	Pin 1: LED anode(+)
	Pin 2: LED cathode(–)
HD (IDE Hard Disk Active LED)	Pin 1: LED anode(+)
	Pin 2: LED cathode(–)
SPK (Speaker Connector)	Pin 1: VCC(+)
	Pin 2- Pin 3: NC
	Pin 4: Data(–)
RE (Reset Switch)	Open: Normal Operation
	Close: Reset Hardware System
P+P–P–(Power LED)	Pin 1: LED anode(+)
	Pin 2: LED cathode(–)
	Pin 3: LED cathode(–)
PW (Soft Power Connector)	Open: Normal Operation
	Close: Power On/Off

Please note:

Please connect the power LED, PC speaker, reset switch and power switch etc of your chassis front panel to the front panel jumper according to the pin assignment above.

JP19: Clear CMOS Function

Normal (Default) **Clear CMOS**
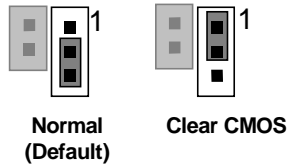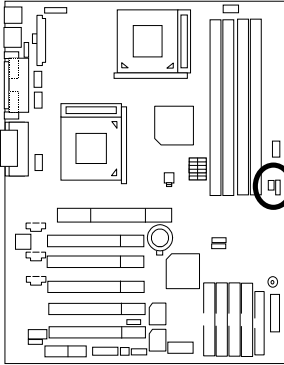
Pin No.	Definition
1-2 close	Clear CMOS
2-3 close	Normal (Default)

Please note:
You may clear the CMOS data to its default values by this jumper.

JP12: Case Open
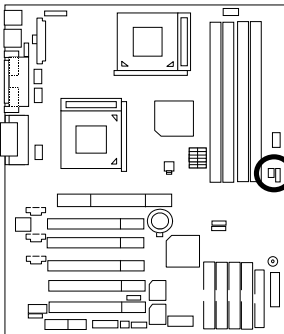
Pin No.	Definition
1	Signal
2	GND

JP10: IDE RAID Selection (Optional)

1   **1**

Enable (Default)   **Disable**
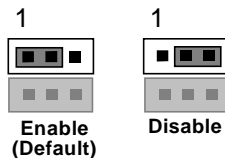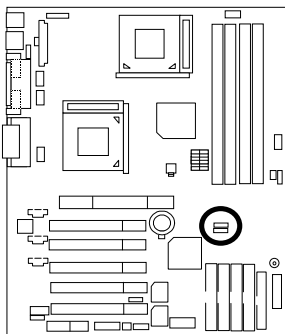
Pin No.	Definition
1-2 close	Enable (Default)
2-3 close	Disable

JP11: RAID/ATA100 Selection (Optional)

1   **1**

ATA 100 Mode (Default)   **RAID Mode**
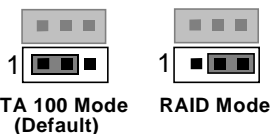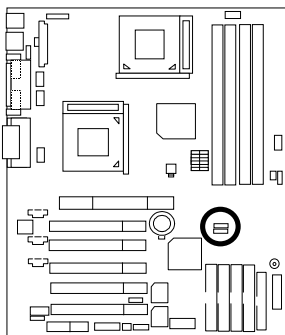
Pin No.	Definition
1-2 close	ATA 100 Mode (Default)
2-3 close	RAID Mode

Please note:
If you want to use "RAID Function", your IDE3 and IDE4 must be connected with Hard Drive. Please set JP10 as enable before adjusting JP11.

JP18: Onboard CODEC Selection (Optional)

Enable (Default)
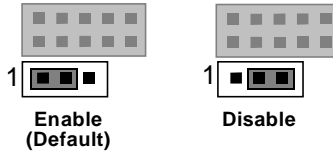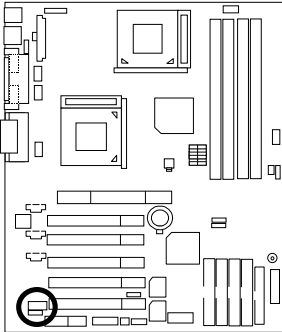
Disable

Pin No.	Definition
1-2 close	Enable (Default)
2-3 close	Disable

JP14: USB1 Device Wake up Selection

USB1

Normal (Default)
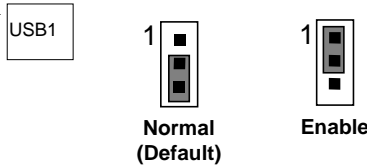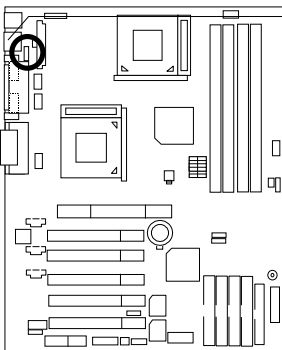
Enable

Pin No.	Definition
1-2 close	USB1 Device Wakeup Enable
2-3 close	Normal (Default)

Please note:
(If you want to use **"USB Dev Wakeup From S5"** function, you have to set the BIOS setting "USB Dev Wakeup From S5" enabled, and the jumper **"JP14"** enabled)
*(Power on the computer and as soon as memory counting starts, press <Del>. You will enter BIOS Setup. Select the item "POWER MANAGEMENT SETUP", then select "USB Dev Wakeup From S5". Remember to save the setting by pressing "ESC" and choose the "SAVE & EXIT SETUP" option.)

JP7: BIOS Write Protection (Optional)

1 ■■■ 1 ■■■

Normal (Default)   **Write Protection**
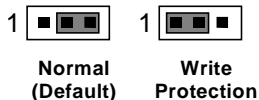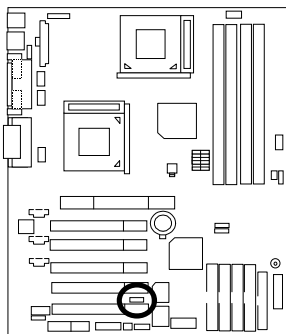
Pin No.	Definition
1-2close	Write Protection
2-3close	Normal (Default)

Please note:
To flash/upgrade BIOS on this MB JP7 must be set to 2-3. We recommend JP7 to be set to 1-2, whenever user does not need to flash/upgrade the BIOS.

BAT1: Battery
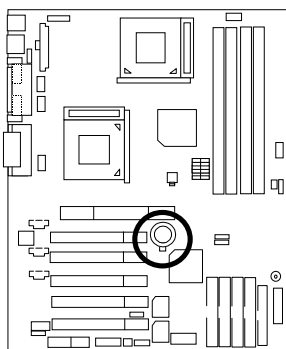
CAUTION
- Danger of explosion if battery is incorrectly replaced.
- Replace only with the same or equivalent type recommended by the manufacturer.
- Dispose of used batteries according to the manufacturer's instructions.

Performance List

The following performance table lists the results of some popular benchmark testing programs. These data are provided as reference only and in no way guarantee the system shall perform, and there is no responsibility for different testing data at exactly the same level. (The different Hardware & Software configuration will result in different benchmark testing results.)

- CPU   Intel Socket370 Pentium® *!!!*   1.13GHz processor x 2

- DRAM   (128x1) MB DDR (MOSEL VITELIC V58C2128804SAT75)

- CACHE SIZE   256 KB integrated in CPU

- DISPLAY   GV-GF2010D

- STORAGE   Onboard IDE (Quantum AS30000AT 30GB)

- O.S.   Windows 2000 + SP1 + DirectX8

- DRIVER   Display Driver at 1024 x 768 x 64k colors x 75Hz.
                         TUCD ver. 1.7

Processor	Intel Pentium®*!!!* Socket 370 1.13GHz x 2 (133x8.5)
Winbench99	
Business Disk Winmark 99	6100
Hi-End Disk Winmark 99	17700
Business Graphics Winmark 99	409
Hi-End Graphics Winmark 99	839
Winstone 2001	
Business Winstone 2001	38.2
Content Creative Winstone 2001	43.7

☞ If you wish to maximize the performance of your system, please refer to the detail on P.53 & P.54.

Block Diagram
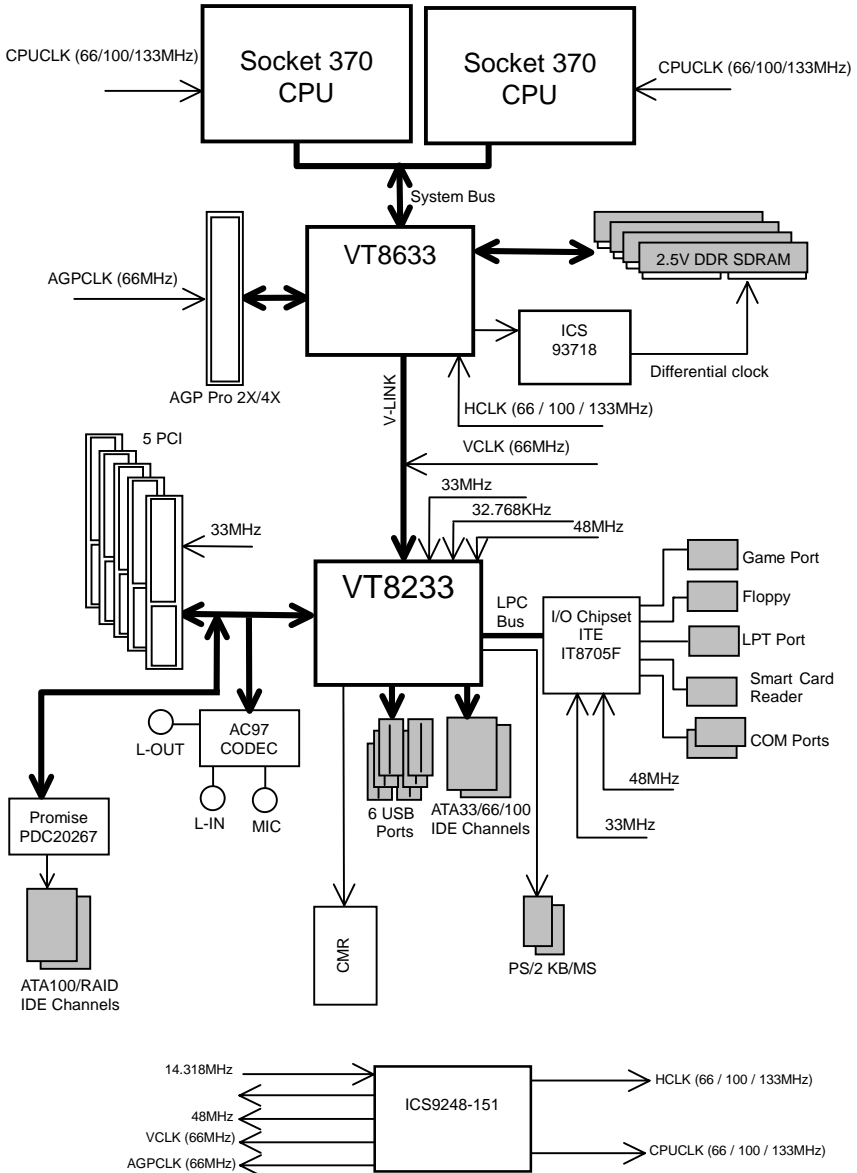
Dual BIOS Introduction (Optional)

A.   What is Dual BIOS Technology?

Dual BIOS means that there are two system BIOS (ROM) on the motherboard, one is the Main BIOS and the other is Backup BIOS. Under the normal circumstances, the system works on the Main BIOS. If the Main BIOS is corrupted or damaged, the Backup BIOS can take over while the system is powered on. This means that your PC will still be able to run stably as if nothing has happened in your BIOS.

B.   How to use Dual BIOS?

a. Boot Screen


```
     American        Release:09/16/99
     Megatrends    AMIBIOS (C) 1999 American Megatrends
xxx   xxx
Check System Health ok , Vcore =2.00V
CPU ID:0673 Patch ID:000A
Pentium III CPU - 600MHz
Check NVRAM…


Wait…
Press F1 to enter Dual BIOS Utility.



( C ) A
63-07
```

Press F1 to enter Dual BIOS Utility.

b.   AMI Dual BIOS Flash ROM Programming Utility

```
┌─────────────────────────────────────────────────────────────┐
│        AMI Dual BIOS Flash ROM Programming Utility          │
├─────────────────────────────────────────────────────────────┤
│ Boot From……………………….. Main BIOS                          │
│ Main ROM Type………………… SST 39SF020                         │
│ Backup ROM Type……………… SST 39SF020                         │
│                                                             │
│         Wide Range Protection Disable                       │
│                    Boot From Main BIOS                      │
│              Auto Recovery Enable                           │
│               Halt On Error Disable                         │
│          Copy Main ROM Data to Backup                       │
│              Load Default Settings                          │
│              Save Settings to CMOS                          │
│                                                             │
│                                                             │
├─────────────────────────────────────────────────────────────┤
│ PgDn/PgUp:Modify(Enter:Run)  ↑↓:Move  ESC:Reset  F10:Power Off│
└─────────────────────────────────────────────────────────────┘
```

c. Dual BIOS Item explanation:

BIOS will auto detect:

Boot From: Main BIOS
Main ROM Type: SST 39SF020
Backup ROM Type: SST 39SF020

Wide Range Protection: Disable(Default),   Enable

Status 1:
If any failure (ex. Update ESCD failure, checksum error or reset…) occurs in the Main BIOS , just before the Operating System is loaded and after the power is on, and that the Wide Range Protection is set to "Enable", the PC will boot from Backup BIOS automatically.

Status 2:
If the ROM BIOS on peripherals cards(ex. SCSI Cards, LAN Cards,..) emits signals to request restart of the system after the user make any alteration on it, the boot up BIOS will not be changed to the Backup BIOS.

Boot From: Main BIOS (Default), Backup BIOS

Status 1:

> The user can set to boot from main BIOS or Backup BIOS.

Auto Recovery: Enabled (Default), Disabled

> When one of the Main BIOS or Backup BIOS occurs checksum failure, the working BIOS will automatically recover the BIOS of checksum failure.
> (In the Power Management Setup of the BIOS Setting, if ACPI Suspend Type is set to Suspend to RAM, the Auto Recovery will be set to Enable automatically.)

(If you want to enter the BIOS setting, please press **"Del"** key when the boot screen appears.)

Halt On Error : Disable(Default),   Enable

> If the BIOS occurs a checksum error or the Main BIOS occurs a WIDE RANGE PROTECTION error and Halt On BIOS Defects set to Enable, the PC will show messages on the boot screen, and the system will pause and wait for the user's instruction.
>
> If Auto Recovery: **Disable**, it will show *<or the other key to continue.>*
> If Auto Recovery: **Enable**, it will show *<or the other key to Auto Recover.>*

Copy Main ROM Data to Backup

Backup message:

> **Are you sure to copy BIOS?**
>> **[Enter] to continue or [Esc] to abort …**
>
> The means that the Main BIOS works normally and could automatically recover the Backup BIOS. Or the means that the Backup BIOS works normally and could automatically recover the Main BIOS.
>
> (This auto recovery utility is set by system automatically and can't be changed by user.)

 DualBIOS™ Technology FAQ

GIGABYTE Technology is pleased to introduce DualBIOS technology, a hot spare for your system BIOS. This newest "Value-added" feature, in a long series of innovations from GIGABYTE, is available on GA-6RXDW Series motherboard. Future GIGABYTE motherboards will also incorporate this innovation.

What's DualBIOS™?

On GIGABYTE motherboards with DualBIOS there are physically two BIOS chips. For simplicity we'll call one your "Main BIOS" and the other is your "Backup" BIOS (your "hot spare"). If your Main BIOS fails, the Backup BIOS almost automatically takes over on your next system boot. Almost automatically and with virtually zero down time! Whether the problem is a failure in flashing your BIOS or a virus or a catastrophic failure of the Main BIOS chip, the result is the same - the Backup BIOS backs you up, almost automatically.

I. Q: What is DualBIOS™ technology?

Answer:

DualBIOS technology is a patented technology from Giga-Byte Technology. The concept of this technology is based on the redundancy and fault tolerance theory. DualBIOS™ technology simply means there are two system BIOSes (ROM) integrated onto the motherboard. One is a main BIOS, and the other is a backup BIOS. The mainboard will operate normally with the main BIOS, however, if the main BIOS is corrupt or damaged for various reasons, the backup BIOS will be automatically used when the system powered-On. Your PC will operate as before the main BIOS was damaged, and is completely transparent to the user.

II. Q: Why does anyone need a motherboard with DualBIOS™ technology?
Answer:

In today's systems there are more and more BIOS failures. The most common reasons are virus attacks, BIOS upgrade failures, and/or deterioration of the BIOS (ROM) chip itself.

1. New computer viruses are being found that attack and destroy the system BIOS. They may corrupt your BIOS code, causing your PC to be unstable or even not boot normally.
2. BIOS data will be corrupted if a power loss/surge occurs, or if a user resets the system, or if the power button is pressed during the process of performing a system BIOS upgrade.
3. If a user mistakenly updates their mainboard with the incorrect BIOS file, then the system may not be able to boot correctly. This may cause the PC system hang in operation or during boot.
4. A flash ROM's life cycle is limited according to electronic characteristics. The modern PC utilizes the Plug and Play BIOS, and is updated regularly. If a user changes peripherals often, there is a slight chance of damage to the flash ROM.

With Giga-Byte Technology's patented DualBIOS™ technology you can reduce the possibility of hangs during system boot up, and/or loss BIOS data due to above reasons. This new technology will eliminate valuable system down time and costly repair bills cause by BIOS failures.

III. Q: How does DualBIOS™ technology work?

Answer:

1. DualBIOS™ technology provides a wide range of protection during the boot up procedure. It protects your BIOS during system POST, ESCD update, and even all the way to PNP detection/assignment.

2. DualBIOS™ provides automatic recovery for the BIOS. When the first BIOS used during boot up does not complete or if a BIOS checksum error occurs, boot-up is still possible. In the DualBIOS™ utility, the "Auto Recovery" option will guarantee that if either the main BIOS or backup BIOS is corrupted, the DualBIOS™ technology will use the good BIOS and correct the wrong BIOS automatically.

3. DualBIOS™ provides manual recovery for the BIOS. DualBIOS™ technology contains a built-in flash utility, which can flash your system BIOS from backup to main and/or visa versa. There is no need for an OS-dependent flash utility program.

4. DualBIOS™ contains a one-way flash utility. The built-in one-way flash utility will ensure that the corrupt BIOS is not mistaken as the good BIOS during recovery and that the correct BIOS (main vs. backup) will be flashed. This will prevent the good BIOS from being flashed.

IV. Q: Who Needs DualBIOS™ technology?
Answer:

1. Every user should have DualBIOS™ technology due to the advancement of computer viruses.

   Everyday, there are new BIOS-type viruses discovered that will destroy your system BIOS. Most commercial products on the market do not have solutions to guard against this type of virus intrusion. The DualBIOS™ technology will provide a state-of-the-art solution to protect your PC:

   Case I.) Vicious computer viruses may wipe out your entire system BIOS. With a conventional single system BIOS PC, the PC will not be functional until it is sent for repairs.

   Case II.) If the "Auto Recovery" option is enabled in the DualBIOS™ utility, and if a virus corrupts your system BIOS, the backup BIOS will automatically reboot the system and correct the main BIOS.

   Case III.) A user may override booting from the main system BIOS. The DualBIOS™ utility may be entered to manually change the boot sequence to boot from the backup BIOS.

2. During or after a BIOS upgrade, if DualBIOS™ detects that the main BIOS is corrupt, the backup BIOS will take over the boot-up process automatically. Moreover, it will verify the main and backup BIOS checksums when booting-up. DualBIOS™ technology examines the checksum of the main and backup BIOS while the system is powered on to guarantee your BIOS operates properly.

3. Power Users will have the advantage of having two BIOS versions on their mainboard. The benefit is being able to select either version BIOS to suit the performance system needs.

4. Flexibility for high-end desktop PCs and workstation/servers. In the DualBIOS™ utility, the option can be set, "Halt On When BIOS Defects," to be enabled to halt your system with a warning message that the main BIOS has been corrupted. Most workstation/servers require constant operation to guarantee services have not been interrupted. In this situation, the "Halt On When BIOS Defects" message may be disabled to avoid system pauses during normal booting.

@BIOS™ Introduction

Gigabyte announces @BIOS™
Windows BIOS live update utility

Have you ever updated BIOS by yourself? Or like many other people, you just know what BIOS is, but always hesitate to update it? Because you think updating newest BIOS is unnecessary and actually you don't know how to update it.

Maybe not like others, you are very experienced in BIOS updating and spend quite a lot of time to do it. But of course you don't like to do it too much. First, download different BIOS from website and then switch the operating system to DOS mode. Secondly, use different flash utility to update BIOS. The above process is not a interesting job. Besides, always be carefully to store the BIOS source code correctly in your disks as if you update the wrong BIOS, it will be a nightmare.

Certainly, you wonder why motherboard vendors could not just do something right to save your time and effort and save you from the lousy BIOS updating work? Here it comes! Now Gigabyte announces @BIOS™--the first Windows BIOS live update utility. This is a smart BIOS update software. It could help you to download the BIOS from internet and update it. Not like the other BIOS update software, it's a Windows utility. With the help of "@BIOS™', BIOS updating is no more than a click.

Besides, no matter which mainboard you are using, if it's a Gigabyte's product*, @BIOS™ help you to maintain the BIOS. This utility could detect your correct mainboard model and help you to choose the BIOS accordingly. It then downloads the BIOS from the nearest Gigabyte ftp site automatically. There are several different choices; you could use "Internet Update" to download and update your BIOS directly. Or you may want to keep a backup for your current BIOS, just choose "Save Current BIOS" to save it first. You make a wise choice to use Gigabyte, and @BIOS™ update your BIOS smartly. You are now worry free from updating wrong BIOS, and capable to maintain and manage your BIOS easily. Again, Gigabyte's innovative product erects a milestone in mainboard industries.

For such a wonderful software, how much it costs? Impossible! It's free! Now, if you buy a Gigabyte's motherboard, you could find this amazing software in the attached driver CD. But please remember, connected to internet at first, then you could have a internet BIOS update from your Gigabyte @BIOS™.

EasyTune**III**™ Introduction

Gigabyte announces **EasyTuneIII™**
Windows overdrive utility

"Overdrive" might be one of the most common issues in computer field. But have many users ever tried it? The answer is probably "no". Because "overdrive" is thought to be very difficult and includes a lot of technical know-how, sometimes "overdrive" is even considered as special skills found only in some enthusiasts.

But as to the experts in "overdrive", what's the truth? They may spend quite a lot of time and money to study, try and use many different hardware and software tools to do "overdrive". And even with these technologies, they still learn that it's quite a risk because the safety and stability of an "overdrive" system is unknown.

Now everything is different because of a Windows overdrive utility EasyTune**III**™--announced by Gigabyte. This utility has totally changed the gaming rule of "overdrive". This is the first overdrive utility suitable for both normal and power users. Users can choose either "Easy Mode" or "Advanced Mode" to run "overdrive" at their convenience. For users who choose "Easy Mode", they just need to click "Auto Optimize" to have auto and immediate CPU overclocking. This software will then overdrive CPU speed automatically with the result being shown in the control panel. If someone prefers to "overdrive" by oneself, there is also another choice. Click "Advanced Mode" to enjoy "sport drive" class overclocking. In "Advanced Mode", one can change the system bus speed in small increments to get ultimate system performance. And no matter which mainboard is used, if it's a Gigabyte's product*, EasyTune**III**™ helps to perform the best of system.

Besides, different from other traditional over-clocking methods, EasyTune**III**™ doesn't require users to change neither BIOS nor hardware switch/ jumper setting; on the other hand, they can do "overdrive" at only one click. Therefore, this is a safer way for "overdrive" as nothing is changed on software or hardware. If user runs EasyTune**III**™ over system's limitation, the biggest lost is only to restart the computer again and the side effect is then well controlled. Moreover, if one well-performed system speed been tested in EasyTune**III**™, user can "Save" this bus speed and "Load" it in next time. Obviously, Gigabyte EasyTune**III**™ has already turned the "overdrive" technology toward to a newer generation.

This wonderful software is now free bundled in Gigabyte motherboard attached driver CD. Users may make a test drive of "EasyTune$\mathrm{III}^{\mathrm{TM}}$" to find out more amazing features by themselves.

For further technical information, please link to: http://www.gigabyte.com.tw

※ **Note: For the latest version of EasyTune$\mathrm{III}^{\mathrm{TM}}$, please visit our website.**

BIOS Setup

BIOS Setup is an overview of the BIOS Setup Interface. The interface allows users to modify the basic system configuration, which is stored in battery-backed CMOS RAM so that it retains the Setup information can be retained when the power is turned off.

ENTERING SETUP

Power ON the computer and press <Del> immediately will allow you to enter Setup. If unsuccessful, you can restart the system and try again by pressing the "RESET" bottom on the system case. You may also restart by simultaneously pressing <Ctrl> – <Alt>– <Del> keys.

CONTROL KEYS

<↑>	Move to previous item
<↓>	Move to next item
<←>	Move to the item in the left hand
<→>	Move to the item in the right hand
<Esc>	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
<+/ PgUp>	Increase the numeric value or make changes
<-/ PgDn>	Decrease the numeric value or make changes
<F1>	General help, only for Status Page Setup Menu and Option Page Setup Menu
<F2>	Reserved
<F3>	Reserved
<F4>	Reserved
<F5>	Restore the previous CMOS value from CMOS, only for Option Page Setup Menu
<F6>	Load the default CMOS value from BIOS default table, only for Option Page Setup Menu
<F7>	Load the Optimized Defaults
<F8>	Reserved
<F9>	Reserved
<F10>	Save all the CMOS changes, only for Main Menu

GETTING HELP

Main Menu

The on-line description of the highlighted setup function is displayed at the bottom of the screen.

Status Page Setup Menu / Option Page Setup Menu

Press F1 to pop up a small help window that describes the appropriate keys to use and the possible selections for the highlighted item. To exit the Help Window press <Esc>.

The Main Menu

Once you enter AMI BIOS CMOS Setup Utility, the Main Menu (Figure 1) will appear on the screen. The Main Menu allows you to select from nine setup functions and two exit choices. Use arrow keys to select among the items and press <Enter> to accept or enter the sub-menu.

```
AMIBIOS SIMPLE SETUP UTILITY – VERSION 1.24e
(C) 1999 American Megatrends, Inc. All Rights Reserved

STANDARD CMOS SETUP            INTEGRATED PERIPHERALS

BIOS FEATURES SETUP            HARDWARE MONITOR & MISC SETUP

CHIPSET FEATURES SETUP         SUPERVISOR PASSWORD

POWER MANAGEMENT SETUP         USER PASSWORD

PNP / PCI CONFIGURATION        IDE HDD AUTO DETECTION

LOAD FAIL-SAFE DEFAULTS        SAVE & EXIT SETUP

LOAD OPTIMIZED DEFAULTS        EXIT WITHOUT SAVING

ESC: Quit    ↑↓→ ← : Select Item   (Shift)F2 : Change Color   F5: Old Values
F6: Load Fail-Safe Defaults      F7: Load Optimized Defaults      F10:Save & Exit

Time, Date , Hard Disk Type…
```

Figure 1: Main Menu

● **Standard CMOS Setup**

This setup page includes all the adjustable items in standard compatible BIOS.

● **BIOS Features Setup**

This setup page includes all the adjustable items of Award special enhanced features.

- **Chipset Features Setup**

  This setup page includes all the adjustable items of chipset special features.

- **Power Management Setup**

  This setup page includes all the adjustable items of Green function features.

- **PNP/PCI Configurations**

  This setup page includes all the adjustable configurations of PCI & PnP ISA resources.

- **Load Fail-Safe Defaults**

  Load Fail-Safe Defaults option loads preset system parameter values to set the system in its most stable configurations.

- **Load Optimized Defaults**

  Load Optimized Defaults option loads preset system parameter values to set the system in its highest performance configurations.

- **Integrated Peripherals**

  This setup page includes all onboard peripherals.

- **Hardware Monitor & MISC Setup**

  Configure hardware monitor features, control frequency/voltage.

- **Set Supervisor Password**

  Set Change or disable password. It allows you to limit access to the system and/or BIOS setup.

- **Set User Password**

  Set Change or disable password. It allows you to limit access to the system.

- **IDE HDD auto detection**

  Automatically configure hard disk parameters.

- **Save & Exit Setup**

  Save CMOS value settings to CMOS and exit setup.

- **Exit Without Saving**

  Abandon all CMOS value changes and exit setup.

Standard CMOS Setup

The items in Standard CMOS Setup Menu (Figure 2) are divided into 10 categories. Each category includes none, one or more than one setup items. Use the arrows to highlight the item and then use the <PgUp> or <PgDn> keys to select the value in each item.

```
AMIBIOS SETUP – STANDARD CMOS SETUP
( C ) 1999 American Megatrends, Inc. All Rights Reserved

Date (mm/dd/yyyy) : Tue Mar 27, 2001
Time (hh/mm/ss)    : 14:44:35


                   TYPE  SIZE  CYLS  HEAD  PRECOMP  LANDZ  SECTOR  MODE
Pri  Master :  Auto
Pri  Slave   :  Auto
Sec Master :  Auto
Sec Slave   :  Auto



Floppy Drive A : 1.44 MB 3½          Base Memory :  640 Kb
Floppy Drive B : Not Installed       Other Memory :  384 Kb
                                     Extended Memory :  255 Mb
Boot Sector Virus Protection : Disabled   Total Memory :  256 Mb

Month : Jan – Dec                    ESC : Exit
Day    : 01– 31                      ↑↓   : Select Item
Year   : 1990 – 2099                 PU / PD / + / – :Modify
                                       (Shift) F2 : Color
```

Figure 2: Standard CMOS Setup

- **Date**

    The date format is <Week> <Month> <Day> <Year>.

Week	The week, from Sun to Sat, determined by the BIOS and is display-only.
Month	The month, Jan. Through Dec.
Day	The day, from 1 to 31 (or the maximum allowed in the month).
Year	The year, from 1990 through 2099.

- **Time**

    The times format in <hour> <minute> <second>. The time is calculated base on the 24-hour military-time clock. For example, 1 p.m. is 13:00:00.

● **Primary Master / Slave, Secondary Master / Slave**

The category identifies the type of hard disk from drive C to F that has been installed in the computer. There are two settings: Auto, and Manual. Manual: HDD type is user-definable; Auto will automatically detect HDD type.

Note that the specifications of your drive must match with the drive table. The hard disk will not work properly if you enter improper information for this category.

If you select User Type, related information will be asked to enter to the following items. Enter the information directly from the keyboard and press <Enter>. Such information should be provided in the documentation form your hard disk vendor or the system manufacturer.

CYLS.	Number of cylinders.
HEADS	number of heads.
PRECOMP	write precomp.
LANDZONE	Landing zone.
SECTORS	number of sectors.

If a hard disk has not been installed select NONE and press <Enter>.

● **Floppy Drive A / Floppy Drive B**

The category identifies the type of floppy disk drive A or drive B that has been installed in the computer.

None	No floppy drive installed.
360K, 5.25 in.	5.25 inch PC-type standard drive; 360K byte capacity.
1.2M, 5.25 in.	5.25 inch AT-type high-density drive; 1.2M byte capacity (3.5 inch when 3 Mode is Enabled).
720K, 3.5 in.	3.5 inch double-sided drive; 720K byte capacity.
1.44M, 3.5 in.	3.5 inch double-sided drive; 1.44M byte capacity.
2.88M, 3.5 in.	3.5 inch double-sided drive; 2.88M byte capacity.

- **Boot Sector Virus Protection**

    If it is set to enable, the category will flash on the screen when there is any attempt to write to the boot sector or partition table of the hard disk drive. The system will halt and the following error message will appear in the mean time. You can run anti-virus program to locate the problem.

Enabled	Activate 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 to appear when anything attempts to access the boot sector or hard disk partition table. **(Default Value)**

- **Memory**

    The category is display-only which is determined by POST (Power On Self Test) of the BIOS.

    Base Memory

    The POST of the BIOS will determine the amount of base (or conventional) memory installed in the system.

    The value of the base memory is typically 512 K for systems with 512 K memory installed on the motherboard, or 640 K for systems with 640 K or more memory installed on the motherboard.

    Other Memory

    This refers to the memory located in the 640 K to 1024 K address space. This is memory that can be used for different applications.

    DOS uses this area to load device drivers to keep as much base memory free for application programs. Most use for this area is Shadow RAM.

    Extended Memory

    The BIOS determines how much extended memory is present during the POST. This is the amount of memory located above 1 MB in the CPU's memory address map.

BIOS Features Setup

```
..............................................................................................
:              AMIBIOS SETUP – BIOS FEATURES SETUP                      :
:            ( C ) 1999 American Megatrends, Inc. All Rights Reserved   :
:..............................................................................................:
| 1st Boot Device           : Floppy   |                                |
| 2nd Boot Device           : IDE-0    |                                |
| 3rd Boot Device           : CDROM    |                                |
| S.M.A.R.T. for Hard Disks : Disabled |                                |
| BootUp Num-Lock           : On       |                                |
| Floppy Drive Seek         : Disabled |                                |
| Password Check            : Setup    |                                |
| CPU Serial Number         : Disabled |                                |
| BIOS Flash Protection     : Disabled |                                |
|                                      |--------------------------------|
|                                      | ESC: Quit      ↑↓→ ←: Select Item |
|                                      | F1  : Help     PU/PD+/-/ : Modify |
|                                      | F5  :Old Values (Shift)F2:Color   |
|                                      | F6  : Load Fail-Safe Defaults     |
|                                      | F7  : Load Optimized Defaults     |
```

Figure 3: BIOS Features Setup

● **1st / 2nd / 3rd Boot Device**

Floppy	Set your boot device priority to Floppy.
LS/ZIP A:	Set your boot device priority to LS/ZIP A:.
ATAPI ZIP C:	Set your boot device priority to ATAPI ZIP C:.
CDROM	Set your boot device priority to CDROM.
SCSI	Set your boot device priority to SCSI.
NETWORK	Set your boot device priority to NETWORK.
RAID/ATA100	Set your boot device priority to RAID/ATA100.
IDE-0~IDE-3	Set your boot device priority to IDE-0~IDE-3.
Disabled	Disable this function.
USB FDD	Set your boot device priority to USB FDD.

● **S.M.A.R.T. for Hard Disks**

Enabled	Enable S.M.A.R.T. Feature for Hard Disks.
Disabled	Disable S.M.A.R.T. Feature for Hard Disks **(Default Value)**

● **Boot Up Num-Lock**

On	Keypad is number keys. **(Default Value)**
Off	Keypad is arrow keys.

- **Floppy Drive Seek**

  During POST, BIOS will determine if the floppy disk drive installed is 40 or 80 tracks. 360 type is 40 tracks while 720, 1.2 and 1.44 are all 80 tracks.

Enabled	BIOS searches for floppy disk drive to determine if it is 40 or 80 tracks. Note that BIOS can't differentiate between from 720, 1.2 or 1.44 drive type as they are all 80 tracks.
Disabled	BIOS will not search for the type of floppy disk drive by track number. Note that there will not be any warning message if the drive installed is 360. **(Default Value)**

- **Password Check**

  Please refer to the detail on P.68

Setup	The user must enter correct password in order to access BIOS setup utility. **(Default Value)**
Always	The user must enter correct password in order to access the system and/or BIOS Setup.

- **CPU Serial Number**

  This item will show up when you install the Pentium® *!!!* processor.

Enabled	Pentium® *!!!* Processor Serial Number Feature.
Disabled	Disable this function. **(Default value)**

- **BIOS Flash Protection**

Enabled	Enable BIOS Flash Protection. This will prevent BIOS Flash write after POST.
Disabled	To flash/upgrade BIOS on this MB, this item must be disable. We recommend this item to be set to "Disabled". **(Default Value)**

Chipset Features Setup

📧 We would not suggest you change the chipset default setting unless you really need it.

```
┌──────────────────────────────────────────────────────────────────────────┐
│              AMIBIOS SETUP – CHIPSET FEATURES SETUP                        │
│            ( C ) 1999 American Megatrends, Inc. All Rights Reserved        │
├───────────────────────────────────────┬────────────────────────────────────┤
│    ***DRAM Timing***                   │                                    │
│ Top Performance            : Disabled  │                                    │
│ DDR Timing by SPD          : Enabled   │                                    │
│    DDR Frequency           : 133MHz    │                                    │
│    DDR CAS# Latency        : 2.5 Cycles│                                    │
│    DDR Bank Interleave     : 4-WAY     │                                    │
│                                        │                                    │
│ DDR Command Rate           : 2T Command│                                    │
│ DRAM Integrity Mode        : Disabled  │                                    │
│ AGP Mode                   : 4X        │                                    │
│ AGP Read Synchronization   : Enabled   │                                    │
│ AGP Fast Write             : Disabled  │                                    │
│ AGP Comp. Driving          : Auto      │                                    │
│ Manual AGP Comp. Driving   : CB        │                                    │
│ AGP Aperture Size          : 64MB      │                                    │
│ PCI Delay Transaction      : Enabled   │                                    │
│ USB Controller             : All USB Port│                                  │
│ USB Legacy Support         : Disabled  │ ESC : Quit        ↑↓→ ←: Select Item│
│                                        │ F1  : Help        PU/PD+/-/ : Modify│
│                                        │ F5  :Old  Values    (Shift)F2:Color │
│                                        │ F6  : Load Fail-Safe Defaults       │
│                                        │ F7  : Load Optimized Defaults       │
└───────────────────────────────────────┴────────────────────────────────────┘
```

Figure 4: Chipset Features Setup

● **Top Performance**

If you wish to maximize the performance of your system, set "Top Performance" as "Enabled".

Disabled	Disable this function. **(Default Value)**
Enabled	Top Performance Enable.

● **DDR Timing by SPD**

Enabled	Enable DDR Timing by SPD. Enable this function, the bios will set DDR Frequency/DDR CAS#/DDR Bank Interleave according to the SPD Data in DDR. **(Default Value)**
Disabled	Disable DDR Timing by SPD.

● **DDR Frequency**

100MHz	Set DDR Frequency to 100MHz.
133MHz	Set DDR Frequency to 133MHz.

- **DDR CAS# Latency**

2 Cycles	Set DDR CAS# Latency to 2 Cycles.
2.5 Cycles	Set DDR CAS# Latency to 2.5 Cycles.

- **DDR Bank Interleave**

4-WAY	Set DDR Bank Interleave to 4-WAY.
2-WAY	Set DDR Bank Interleave to 2-WAY.
Disabled	Disable this function.

- **DDR Command Rate**

  If you wish to maximize the performance of your DDR, set "DDR Command Rate" as "1T Command" and set "Top Performance" as "Enabled". Please note, enabling this function may cause your system to become unstable. **For power End-User use only.**

2T Command	Set DDR Command Rate to 2T Command. **(Default Value)**
1T Command	Set DDR Command Rate to 1T Command.

- **DRAM Integrity Mode**

Disabled	Disable this function. **(Default Value)**
ECC	Single-bit error correction and multi-bit error detection.

- **AGP Mode**

4X	Set AGP Mode to 4X (Only if the AGP Card support 4X Rate). **(Default Value)**
1X	Set AGP Mode to 1X.
2X	Set AGP Mode to 2X.

- **AGP Read Synchronization**

Enabled	Enable AGP Read Synchronization. **(Default Value)**
Disabled	Disable AGP Read Synchronization.

- **AGP Fast Write**

Enabled	Enable this function only if the AGP Card support Fast Write Function. (Enable this function can increase AGP performance).
Disabled	Disable this function. **(Default Value)**

● **AGP Comp. Driving**

Auto	Set AGP Comp. Driving to Auto. **(Default Value)**
Manual	Set AGP Comp. Driving to Manual.

If AGP Comp. Driving is Manual.

Manual AGP Comp. Driving:	00~FF

● **AGP Aperture Size**

4 MB	Display AGP Aperture Size is 4MB.
8 MB	Display AGP Aperture Size is 8MB.
16 MB	Display AGP Aperture Size is 16MB.
32 MB	Display AGP Aperture Size is 32MB.
64 MB	Display AGP Aperture Size is 64MB. **(Default Value)**
128 MB	Display AGP Aperture Size is 128MB.
256 MB	Display AGP Aperture Size is 256MB.

● **PCI Delay Transaction**

Enabled	Enable Delay Transaction. **(Default Value)**
Disabled	Disable Delay Transaction.

● **USB Controller**

All USB Port	Enable All USB Ports 0,1,2,3,4,5. **(Default Value)**
Disabled	Disable USB Controller.
Port 0&1	Enable USB Ports 0&1.
Port 2&3	Enable USB Ports 2&3.
Port 0&1, 2&3	Enable USB Ports 0&1, 2&3.
Port 4&5	Enable USB Ports 4&5.
Port 0&1, 4&5	Enable USB Ports 0&1, 4&5.
Port 2&3, 4&5	Set USB Controller to Port 2&3, 4&5.

● **USB Legacy Support**

Keyboard/FDD	Enable USB Legacy Support for USB Keyboard & USB Floppy.
KB/Mouse/FDD	Enable USB Legacy Support for USB Keyboard/USB Mouse & USB Floppy.
Disabled	Disable USB Legacy Support Function. **(Default Value)**

Power Management Setup

```
                AMIBIOS SETUP – POWER MANAGEMENT SETUP
              ( C ) 1999 American Megatrends, Inc. All Rights Reserved
┌────────────────────────────────────────────────┬─────────────────────────────────┐
│ USB Dev Wakeup From S5        : Disabled        │                                 │
│ IRQ3                          : Monitor         │                                 │
│ IRQ4                          : Monitor         │                                 │
│ IRQ5                          : Ignore          │                                 │
│ IRQ7                          : Monitor         │                                 │
│ IRQ9                          : Ignore          │                                 │
│ IRQ10                         : Ignore          │                                 │
│ IRQ11                         : Ignore          │                                 │
│ IRQ13                         : Ignore          │                                 │
│ IRQ14                         : Monitor         │                                 │
│ IRQ15                         : Ignore          │                                 │
│ Soft-Off by Power Button      : Instant Off     │                                 │
│ AC Back Function              : Off             │                                 │
│ Modem Ring On/Wake On Lan     : Enabled         │                                 │
│ PME Event Wake Up             : Enabled         │                                 │
│ Resume On RTC Alarm           : Disabled        │ ESC: Quit    ↑↓→←: Select Item  │
│  RTC Alarm Date               : 15              │ F1  : Help   PU/PD+/-/ : Modify  │
│  RTC Alarm Hour               : 12              │ F5 :Old Values   (Shift)F2:Color │
│  RTC Alarm Minute             : 30              │ F6 : Load Fail-Safe Defaults    │
│  RTC Alarm Second             : 30              │ F7 : Load Optimized Defaults    │
└────────────────────────────────────────────────┴─────────────────────────────────┘
```

Figure 5: Power Management Setup

● **USB Dev Wakeup From S5**

Enabled	Enable USB Dev Wakeup from ACPI S5 mode.
Disabled	Disable USB Dev Wakeup from ACPI S5 mode. **(Default Value)**

● **IRQ 3~IRQ15**

Ignore	Ignore IRQ3 ~IRQ15.
Monitor	IRQ3~IRQ15 event can wake up the system from sleep state (S1).

● **Soft-off by Power Button**

Instant off	The user press the power button once, he can turn off the system. **(Default Value)**
Suspend	The user press the power button once, then he can enter suspend mode.

● **AC Back Function**

Off	When AC-power back to the system, the system will be in "Off" state. **(Default Value)**

On	When AC-power back to the system, the system will be in "On" state.
Last State	When AC-power back to the system, the system will return to the Last state before AC-power off.

- **Modem Ring On / Wake On Lan**

Disabled	Disable Modem Ring On / Wake On LAN function.
Enabled	The modem ring / LAN wake up will bring the system out of soft-off or suspend state if this option is set "Enabled". **(Default Value)**

- **PME Event Wake up**

Disabled	Disable PME event wake up function.
Enabled	The PME event wake up will bring the system out of soft-off or suspend state if this option is set "Enabled". **(Default Value)**

- **Resume On RTC Alarm**

You can set "Resume On RTC Alarm" item to enabled and key in Data/time to power on system.

Disabled	Disable this function. **(Default Value)**
Enabled	Enable alarm function to POWER ON system.

If the default value is Enabled.

RTC Alarm Date:	Every Day, 1~31
RTC Alarm Hour:	0~23
RTC Alarm Minute:	0~59
RTC Alarm Second:	0~59

PNP/PCI Configuration

```
AMIBIOS SETUP – PNP / PCI CONFIGURATION
( C ) 1999 American Megatrends, Inc. All Rights Reserved

Reset Configuration Data       : No
VGA Boot from                  : AGP
PCI Slot 1,5 IRQ Priority      : Auto
PCI Slot 2 IRQ Priority        : Auto
PCI Slot 3 IRQ Priority        : Auto
PCI Slot 4 IRQ Priority        : Auto
IRQ3                           : PCI/PnP
IRQ4                           : PCI/PnP
IRQ5                           : PCI/PnP
IRQ7                           : PCI/PnP
IRQ9                           : PCI/PnP
IRQ10                          : PCI/PnP
IRQ11                          : PCI/PnP
IRQ14                          : PCI/PnP
IRQ15                          : PCI/PnP

                                          ESC: Quit        ↑↓→ ←: Select Item
                                          F1  : Help      PU/PD+/-/ : Modify
                                          F5  :Old Values  (Shift)F2:Color
                                          F6  : Load Fail-Safe Defaults
                                          F7  : Load Optimized Defaults
```

Figure 6: PNP/ PCI Configuration

- **Reset Configuration Data**

    Advising BIOS clear PnP configuration data for usable value.

No	Disable this function. **(Default Value)**
Yes	Reset PnP configuration data in order to re-initialize ESCD for PnP device.

- **VGA Boot from**

AGP	Set VGA Boot from AGP VGA Card. **(Default Value)**
PCI	Set VGA Boot from PCI VGA Card.

- **PCI Slot 1,5 IRQ Priority**

Auto	The system will reserved a free IRQ for PCI slot 1 & 5 device. **(Default Value)**
3	The system will reserved IRQ3 for PCI slot 1 & 5 device if no legacy ISA device using IRQ3.
4	The system will reserved IRQ4 for PCI slot 1 & 5 device if no legacy ISA device using IRQ4.
5	The system will reserved IRQ5 for PCI slot 1 & 5 device if no legacy ISA device using IRQ5.

7	The system will reserved IRQ7 for PCI slot 1 & 5 device if no legacy ISA device using IRQ7.
9	The system will reserved IRQ9 for PCI slot 1 & 5 device if no legacy ISA device using IRQ9.
10	The system will reserved IRQ10 for PCI slot 1 & 5 device if no legacy ISA device using IRQ10.
11	The system will reserved IRQ11 for PCI slot 1 & 5 device if no legacy ISA device using IRQ11.

● **PCI Slot 2 / 3 / 4 IRQ Priority**

Auto	The system will reserved a free IRQ for PCI slot 2 / 3 / 4 device. **(Default Value)**
3	The system will reserved IRQ3 for PCI slot 2 / 3 / 4 device if no legacy ISA device using IRQ3.
4	The system will reserved IRQ for PCI slot 2 / 3 / 4 device if no legacy ISA device using IRQ4.
5	The system will reserved IRQ5 for PCI slot 2 / 3 / 4 device if no legacy ISA device using IRQ5.
7	The system will reserved IRQ7 for PCI slot 2 / 3 / 4 device if no legacy ISA device using IRQ7.
9	The system will reserved IRQ9 for PCI slot 2 / 3 / 4 device if no legacy ISA device using IRQ9.
10	The system will reserved IRQ10 for PCI slot 2 / 3 / 4 device if no legacy ISA device using IRQ10.
11	The system will reserved IRQ11 for PCI slot 2 / 3 / 4 device if no legacy ISA device using IRQ11.

● **IRQ (3, 4, 5, 7, 9, 10, 11, 14, 15)**

ISA/ EISA	The resource is reserved for Legacy ISA device.
PCI / PnP	The resource is reserved for PCI/ PnP device. **(Default Value)**

Load Fail-Safe Defaults

```
                AMIBIOS SIMPLE SETUP UTILITY-VERSION 1.24e
                ( C ) 1999 American Megatrends, Inc. All Rights Reserved

 STANDARD CMOS SETUP              INTEGRATED PERIPHERALS

 BIOS FEATURES SETUP              HARDWARE MONITOR & MISC SETUP

 CHIPSET FEATURES SETUP           SUPERVISOR PASSWORD

 POWER MANAGEMENT SETUP           USER PASSWORD

 PNP/PCI CONFIG    Load Fail-Safe Defaults (Y/N)?N   CTION

 LOAD FAIL-SAFE DEFAULTS          SAVE & EXIT SETUP

 LOAD OPTIMIZED DEFAULTS          EXIT WITHOUT SAVING

 ESC : Quit   ↑↓→← : Select Item   (Shift) F2 : Change Color   F5 : Old Values
 F6   : Load Fail-Safe Defaults    F7: Load Optimized Defaults     F10: Save & Exit

              Load Fail-Safe Defaults except Standard CMOS SETUP
```

Figure 7: Load Fail-Safe Defaults

● **Load Fail-Safe Defaults**

Fail–Safe defaults contain the most appropriate system parameter values of to configure the system to achieve maximum stability.

Load Optimized Defaults

```
            AMIBIOS SIMPLE SETUP UTILITY-VERSION 1.24e
          ( C ) 1999 American Megatrends, Inc. All Rights Reserved
```

STANDARD CMOS SETUP	INTEGRATED PERIPHERALS
BIOS FEATURES SETUP	HARDWARE MONITOR & MISC SETUP
CHIPSET FEATURES SETUP	SUPERVISOR PASSWORD
POWER MANAGE	Load Optimized Defaults (Y/N)?N
PNP/PCI CONFIG	CTION
LOAD FAIL-SAFE DEFAULTS	SAVE & EXIT SETUP
LOAD OPTIMIZED DEFAULTS	EXIT WITHOUT SAVING

```
ESC : Quit   ↑↓→← : Select Item   (Shift) F2 : Change Color   F5 : Old Values
F6   : Load Fail-Safe Defaults     F7: Load Optimized Defaults      F10: Save & Exit
```

```
          Load Optimized Defaults except Standard CMOS SETUP
```

Figure 8: Load Optimized Defaults

- **Load Optimized Defaults**

    Optimized defaults contain the most appropriate system parameter values to configure
    the system to achieve maximum performance.

Integrated Peripherals

```
                    AMIBIOS SETUP – INTEGRATED PERIPHERALS
                ( C ) 1999 American Megatrends, Inc. All Rights Reserved
 OnBoard IDE                    : Both
 OnBoard AC'97 Audio            : Auto
 OnBoard MC'97 Modem            : Auto
 OnBoard FDC                    : Auto
 OnBoard Serial Port 1          : Auto
 OnBoard Serial Port 2          : Auto
   Serial Port 2 Mode           : Normal
 OnBoard CIR Port               : Disabled
   CIR Port IRQ                 : N/A
 OnBoard Parallel Port          : Auto
   Parallel Port Mode           : ECP
   Parallel Port IRQ            : Auto
   Parallel Port DMA            : Auto
 OnBoard MIDI Port              : 300
   MIDI Port IRQ                : 5        ESC: Quit        ↑↓→ ←: Select Item
 OnBoard Game Port              : Enabled  F1   : Help      PU/PD+/-/ : Modify
                                           F5   :Old  Values  (Shift)F2:Color
                                           F6   : Load Fail-Safe Defaults
                                           F7   : Load Optimized Defaults
```

Figure 9: Integrated Peripherals

- **OnBoard IDE**

Disabled	Disable OnBoard IDE.
Both	Both Primary & Secondary IDE channel will be enabled. **(Default Value)**
Primary	Only Primary IDE channel is enable.
Secondary	Only Secondary IDE channel is enable.

- **OnBoard AC'97 Audio**

Auto	BIOS will search AC97 Codec. If found, AC97 function will be enabled. If no AC97 Codec found, AC97 function will be disabled. **(Default Value)**
Disabled	Disable this function.

- **OnBoard MC'97 Modem**

Auto	BIOS will search MC97 Codec (AMR Modem Card). If found, MC97 function will be enabled. If no MC97 Codec found, MC97 function will be disabled. **(Default Value)**
Disabled	Disable this function.

- **OnBoard FDC**

Disabled	Disable this function.
Enabled	Enable on board floppy disk controller.
Auto	Set the floppy disk controller automatically. **(Default Value)**

- **OnBoard Serial Port 1**

Auto	BIOS will automatically setup the port 1 address. **(Default Value)**
3F8/COM1	Enable OnBoard Serial port 1 and address is 3F8.
2F8/COM2	Enable OnBoard Serial port 1 and address is 2F8.
3E8/COM3	Enable OnBoard Serial port 1 and address is 3E8.
2E8/COM4	Enable OnBoard Serial port 1 and address is 2E8.
Disabled	Disable OnBoard Serial port 1.

- **OnBoard Serial Port 2**

Auto	BIOS will automatically setup the port 2 address. **(Default Value)**
3F8/COM1	Enable OnBoard Serial port 2 and address is 3F8.
2F8/COM2	Enable OnBoard Serial port 2 and address is 2F8.
3E8/COM3	Enable OnBoard Serial port 2 and address is 3E8.
2E8/COM4	Enable OnBoard Serial port 2 and address is 2E8.
Disabled	Disable OnBoard Serial port 2.

- **Serial Port 2 Mode**

  (This item allows you to determine which Serial Port B Mode of onboard I/O chip)

Normal	Set onboard I/O chip Serial Port B to Normal Mode. **(Default Value)**
IrDA	Set onboard I/O chip Serial Port B to IrDA Mode.
ASKIR	Set onboard I/O chip Serial Port B to ASKIR Mode.
SCR	Set onboard I/O chip Serial Port B to Smart Card Reader.

- **OnBoard CIR port**

Disabled	Disable this function. **(Default Value)**
Enabled	Enable Onboard CIR port.

- **CIR Port IRQ**

IRQ 3 / 4 / 5 / 10 / 11 / N/A. **(Default Value)**

● **OnBoard Parallel port**

378	Set On Board LPT port and address to 378.
278	Set On Board LPT port and address to 278.
3BC	Set On Board LPT port and address to 3BC.
Auto	Set On Board LPT port Automatically. **(Default Value)**
Disabled	Disable this function.

● **Parallel Port Mode**

EPP	Using Parallel port as Enhanced Parallel Port.
ECP	Using Parallel port as Extended Capabilities Port. **(Default Value)**
Normal	Normal Operation.
EPP+ECP	Using Parallel port as Enhanced Parallel Port & Extended Capabilities Port.

● **Parallel Port IRQ**

7	Set Parallel Port IRQ to 7.
5	Set Parallel Port IRQ to 5.
Auto	Set Parallel Port IRQ automatically. **(Default Value)**

● **Parallel Port DMA**

3	Set Parallel Port DMA to 3.
1	Set Parallel Port DMA to 1.
0	Set Parallel Port DMA to 0.
Auto	Set Parallel Port DMA automatically. **(Default Value)**

● **OnBoard MIDI Port**

300	Set OnBoard MIDI Port to 300. **(Default Value)**
310	Set OnBoard MIDI Port to 310.
320	Set OnBoard MIDI Port to 320.
330	Set OnBoard MIDI Port to 330.
Disabled	Disable this function.

● **MIDI Port IRQ**

5	Set MIDI Port IRQ to 5. **(Default Value)**
10	Set MIDI Port IRQ to 10.
11	Set MIDI Port IRQ to 11.

- **OnBoard Game Port**

Enabled	Enable OnBoard Game Port function. **(Default Value)**
Disabled	Disable this function.

Hardware Monitor & MISC Setup

```
...................................................................................................................
:            AMIBIOS SETUP – HARDWARE MONITOR & MISC SETUP                :
:              ( C ) 1999 American Megatrends, Inc. All Rights Reserved     :
:.................................................................................................................:
```

CPU Ratio Selection	: 4.0X	+5.000V	: +5.080V
CPU Temp. Alarm	: Disabled	+12.000V	: +11.840V
CPU1 Fan Fail Alarm	: Yes	-12.000V	: -13.054V
CPU2 Fan Fail Alarm	: Yes	-5.000V	: -5.254V
System Fan Fail Alarm	: No	5VSB	: +4.972V
Reset Case Open Status	: No	Battery	: +3.024V
Case Status	: Closed		
CPU1 Temp.	: 35°C/ 95°F		
CPU2 Temp.	: 38°C/ 86°F		
System Temp.	: 33°C/ 91°F		
CPU1 Fan Speed	: 5273 RPM		
CPU2 Fan Speed	: 0 RPM		
System Fan Speed	: 0 RPM		
CPU1 VID	: 1.65V		
CPU2 VID	: 1.30V		
CPU1 Present	: OK!	ESC: Quit ↑↓→ ←: Select Item	
CPU2 Present	: FAIL!	F1 : Help PU/PD+/-/ : Modify	
Vcc2P	: +1.632V	F5 :Old Values (Shift)F2:Color	
Vcc2S	: +1.312V	F6 : Load Fail-Safe Defaults	
+3.300V	: +3.216V	F7 : Load Optimized Defaults	

Figure 10: Hardware Monitor & MISC Setup

● **CPU Ratio Selection**

This option will not affect CPU ratio if you are using a locked-ratio CPU.

For Coppermine CPU.

3.0X/3.5X/4.0X/4.5X/5.0X/5.5X/6.0X/6.5X/7.0X/7.5X/8.0X

For Coppermine D type CPU.

5.5X/6.0X/6.5X/7.0X/7.5X/8.0X/8.5X/9.0X/9.5X/10.0X/10.5X/11.0X/11.5X/12.0X

● **CPU Temp. Alarm**

60°C / 140°F	Monitor CPU Temp. at 60°C / 140°F.
70°C / 158°F	Monitor CPU Temp. at 70°C / 158°F.
80°C / 176°F	Monitor CPU Temp. at 80°C / 176°F.
90°C / 194°F	Monitor CPU Temp. at 90°C / 194°F.
Disabled	Disabled this function. **(Default Value)**

● **Fan Fail Alarm**

CPU1 / CPU2

No	Fan Fail Alarm Function Disabled.
Yes	Fan Fail Alarm Function Enabled. **(Default Value)**

● **System Fan Fail Alarm**

No	Fan Fail Alarm Function Disabled. **(Default Value)**
Yes	Fan Fail Alarm Function Enabled.

● **Reset Case Open Status**

● **Case Status**

If the case is closed, "Case Status" will show "Closed".
If the case have been opened, "Case Status" will show "Open".
If you want to reset "Case Status" value, set "Reset Case Open Status"
to "Enabled" and save CMOS, your computer will restart.

● **CPU1/CPU2 Temp.**

Detect CPU1/CPU2 Temp. automatically.

● **System Temp.**

Detect System Temp. automatically.

● **CPU1 Fan / CPU2 Fan / System Fan Speed (RPM)**

Detect Fan speed status automatically.

● **CPU1 VID / CPU2 VID**

Use CPU VID to show CPU Vcore voltage.

● **CPU1 Present / CPU2 Present**

Detect CPU present status.

● **Voltage (V) Vcc2P / Vcc2S / +3.3V / ±12V / ±5V / 5VSB / Battery**

Detect system's voltage status automatically.

BIOS Setup

Supervisor / User Password

When you select this function, the following message will appear at the center of the screen to assist you in creating a password.

```
┌─────────────────────────────────────────────────────────────────┐
│         AMIBIOS SIMPLE SETUP UTILITY-VERSION 1.24e               │
│         ( C ) 1999 American Megatrends, Inc. All Rights Reserved │
├─────────────────────────────────┬───────────────────────────────┤
│ STANDARD CMOS SETUP             │ INTEGRATED PERIPHERALS         │
│                                 │                               │
│ BIOS FEATURES SETUP             │ HARDWARE MONITOR & MISC SETUP  │
│                                 │                               │
│ CHIPSET FEATURES SETUP          │ SUPERVISOR PASSWORD            │
│                                 │                               │
│ POWER MANAGE┌──────────────────────────────┐                    │
│             │ Enter new supervisor password:│                   │
│ PNP/PCI CONFIGU                          TION│                    │
│             └──────────────────────────────┘                    │
│ LOAD FAIL-SAFE DEFAULTS         │ SAVE & EXIT SETUP             │
│                                 │                               │
│ LOAD OPTIMIZED DEFAULTS         │ EXIT WITHOUT SAVING           │
├─────────────────────────────────┴───────────────────────────────┤
│ ESC : Quit   ↑↓→← : Select Item  (Shift) F2 : Change Color  F5 : Old Values │
│ F6  : Load Fail-Safe Defaults    F7: Load Optimized Defaults    F10: Save & Exit │
├─────────────────────────────────────────────────────────────────┤
│             Change / Set / Disable Password                     │
└─────────────────────────────────────────────────────────────────┘
```

Figure 11: Password Setting

Type the password, up to six characters, and press <Enter>. 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 password, just press <Enter> when you are prompted to enter password. A message "**PASSWORD DISABLED**" will appear to confirm the password being disabled. Once the password is disabled, the system will boot and you can enter Setup freely.

The BIOS Setup program allows you to specify two separate passwords: a **SUPERVISOR PASSWORD** and a **USER PASSWORD**. When disabled, anyone may access all BIOS Setup program function. When enabled, the Supervisor password is required for entering the BIOS Setup program and having full configuration fields, the User password is required to access only basic items.

If you select "**Always**" at "**Password Check**" in BIOS Features Setup Menu, you will be prompted for the password every time the system is rebooted or any time you try to enter Setup Menu.

If you select "**Setup**" at "**Password Check**" in BIOS Features Setup Menu, you will be prompted only when you try to enter Setup.

IDE HDD Auto Detection

```
┌─────────────────────────────────────────────────────────────────────┐
│                  AMIBIOS SETUP – STANDARD CMOS SETUP                  │
│         ( C ) 1999 American Megatrends, Inc. All Rights Reserved      │
├─────────────────────────────────────────────────────────────────────┤
│ Date (mm/dd/yyyy) : Tue Mar 27, 2001                                  │
│ Time (hh/mm/ss)   : 10:36:24                                          │
│          TYPE    SIZE   CYLS   HEAD   PRECOMP   LANDZ SECTOR   MODE    │
├─────────────────────────────────────────────────────────────────────┤
│ Pri Master   : Not Installed                                          │
│ Pri Slave    : Not Installed                                          │
│ Sec Master : Not Installed                                            │
│ Sec Slave   : Not Installed                                           │
│                                    ┌──────────────────────────────┐   │
│ Floppy Drive A:   1.44 MB 3 ½      │ Base Memory : 640 Kb         │   │
│ Floppy Drive B:   Not Installed    │ Other Memory: 384 Kb         │   │
│                                    │ Extended Memory: 255Mb       │   │
│ Boot Sector Virus Protection : Disabled  │ Total Memory: 256Mb    │   │
├─────────────────────────────────────────────────────────────────────┤
│ Month:    Jan – Dec                       ESC : Exit                  │
│   Day:     01  – 31                       ↑↓   : Select Item          │
│  Year :   1990– 2099                      PU/PD/+/–   : Modify        │
│                                           (Shift)F2     : Color       │
└─────────────────────────────────────────────────────────────────────┘
```

Figure 12: IDE HDD Auto Detection

Type "Y" will accept the H.D.D. parameter reported by BIOS.

Type "N" will keep the old H.D.D. parameter setup. If the hard disk cylinder number is over 1024, then the user can select LBA mode or LARGER mode for DOS partition larger than 528 MB.

Save & Exit Setup

```
AMIBIOS SIMPLE SETUP UTILITY-VERSION 1.24e
( C ) 1999 American Megatrends, Inc. All Rights Reserved

STANDARD CMOS SETUP              INTEGRATED PERIPHERALS

BIOS FEATURES SETUP             HARDWARE MONITOR & MISC SETUP

CHIPSET FEATURES SETUP          SUPERVISOR PASSWORD

POWER MANAGE
                  SAVE to CMOS and EXIT(Y/N)? Y
PNP/PCI CONFIG                                      TION

LOAD FAIL-SAFE DEFAULTS         SAVE & EXIT SETUP

LOAD OPTIMIZED DEFAULTS         EXIT WITHOUT SAVING

ESC : Quit   ↑↓→← : Select Item   (Shift) F2 : Change Color   F5 : Old Values
F6   : Load Fail-Safe Defaults    F7: Load Optimized Defaults      F10: Save & Exit

Save Data to CMOS & Exit SETUP
```

Figure 13: Save & Exit Setup

Type "Y" will quit the Setup Utility and save the user setup value to RTC CMOS.

Type "N" will return to Setup Utility.

Exit Without Saving

```
AMIBIOS SIMPLE SETUP UTILITY-VERSION 1.24e
( C ) 1999 American Megatrends, Inc. All Rights Reserved

STANDARD CMOS SETUP              INTEGRATED PERIPHERALS

BIOS FEATURES SETUP              HARDWARE MONITOR & MISC SETUP

CHIPSET FEATURES SETUP           SUPERVISOR PASSWORD

POWER MANAGEMENT SETUP           USER PASSWORD

PNP/PCI CONFIGU        Quit without saving (Y/N)? N        TION

LOAD FAIL-SAFE DEFAULTS          SAVE & EXIT SETUP

LOAD OPTIMIZED DEFAULTS          EXIT WITHOUT SAVING

ESC : Quit   ↑↓→← : Select Item   (Shift) F2 : Change Color   F5 : Old Values
F6   : Load Fail-Safe Defaults     F7: Load Optimized Defaults      F10: Save & Exit

Abandon all Datas & Exit SETUP
```

Figure 14: Exit Without Saving

Type "Y" will quit the Setup Utility and save the user setup value to RTC CMOS.

Type "N" will return to Setup Utility.

Technical Support / RMA Sheet

Customer/Country:		Company:		Phone No.:	
Contact Person:		E-mail Add. :			

Model name/Lot Number:				PCB revision:	
BIOS version:		O.S./A.S.:			

Hardware Configuration	Mfs.	Model name	Size:	Driver/Utility:
CPU				
Memory Brand				
Video Card				
Audio Card				
HDD				
CD-ROM / DVD-ROM				
Modem				
Network				
AMR / CNR				
Keyboard				
Mouse				
Power supply				
Other Device				

Problem Description:

_____

_____

Appendix

Appendix A: VIA VT8633 PRO266 Chipsets Driver Installation

A.VIA 4 in 1 Service Pack Driver:

Insert the support CD that came with your motherboard into your CD-ROM driver or double –click the CD driver icon in My Computer to bring up the screen.

1.Click "VIA 4in 1 Service Pack Driver" item.

(1)

2.Click "Next".

(2)

3.Click "Yes".

(3)

4.Click "Next".

(4)

5.Click "Next".

(5)

(6)

6.Click "Finish" to restart computer.
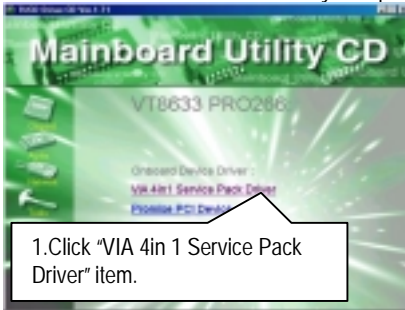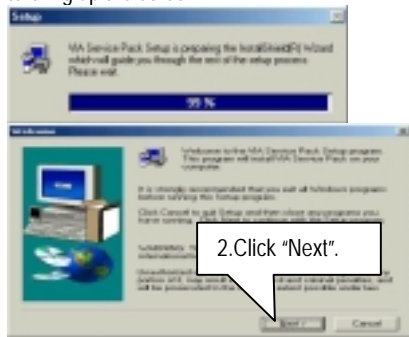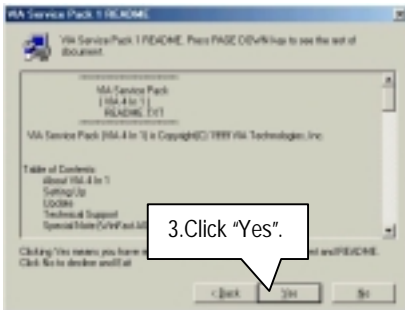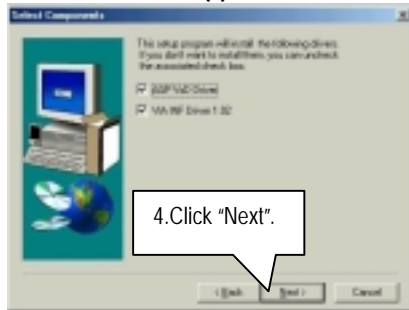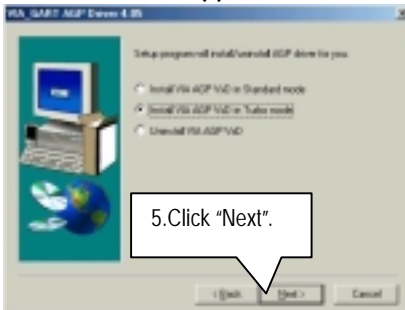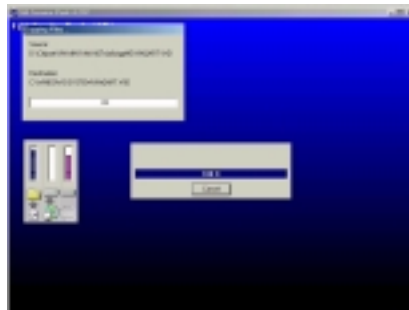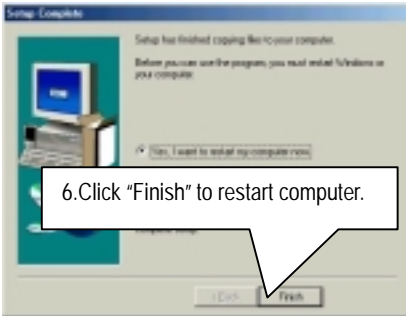
(7)

Appendix B: Promise PCI Device Installation

A. Promise ATA100 Driver Installation:

Insert the support CD that came with your motherboard into your CD-ROM driver or double –click the CD driver icon in My Computer to bring up the screen.
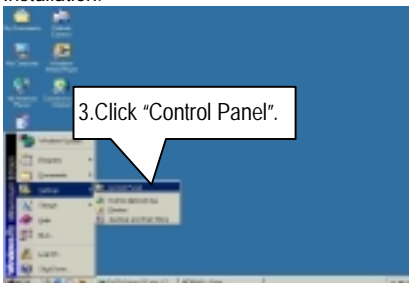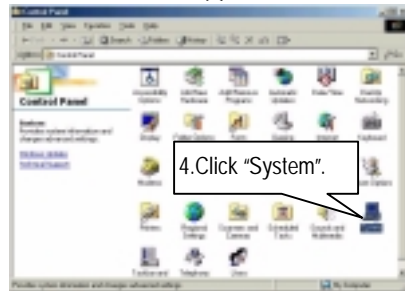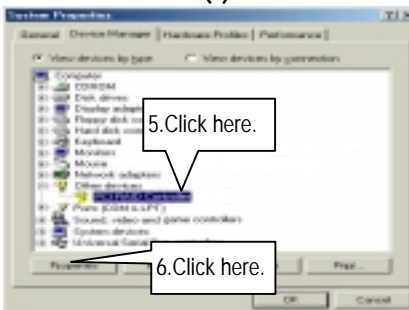

1.Click "Promise PCI Device".

(1)

2. Refer "Driver Information" to setup your system.

(2)
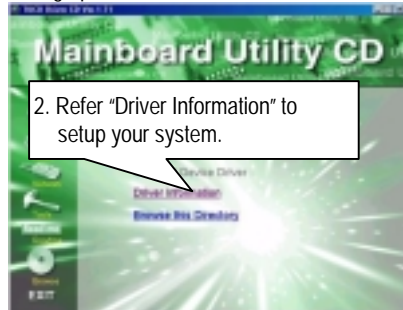
For your reference, you can use the following steps to complete the Promise ATA100 Driver Installation.

3.Click "Control Panel".

(3)

4.Click "System".

(4)

5.Click here.

6.Click here.

(5)

7.Click here.

(6)

(7)

(8)

(9)

(10)

(11)

(12)

(13)

(14)

18.Click "Next".

19.Click "Finish".

20.Click "Yes" to restart computer.

(15)

If you want to realize the setup information in detail, please refer to the "Driver Information" for setting your system completely.

B. Promise RAID Driver Installation:

Insert the support CD that came with your motherboard into your CD-ROM driver or double –click the CD driver icon in My Computer to bring up the screen.

(1)

2. Refer "Driver Information" to setup your system.

1.Click "Promise PCI Device".

(2)
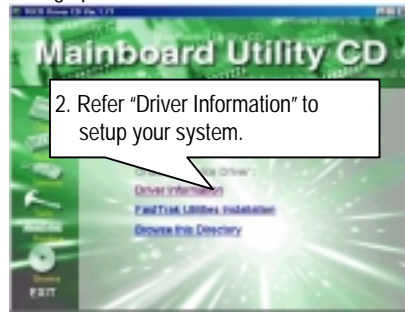
For your reference, you can use the following steps to complete the Promise RAID Driver Installation.

3.Click "Control Panel".

4.Click "System".

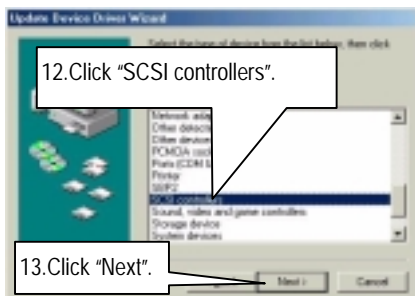**(3)**

(4)

5.Click here.

7.Click here.

6.Click here.

(5)

(6)

8.Click here.

9.Click "Next".

(7)

10.Click here.

11.Click "Next".

(8)

12.Click "SCSI controllers".

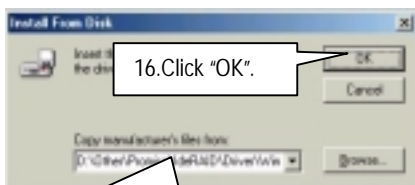13.Click "Next".
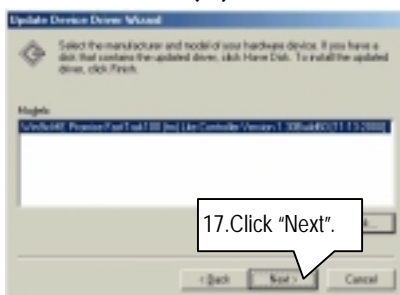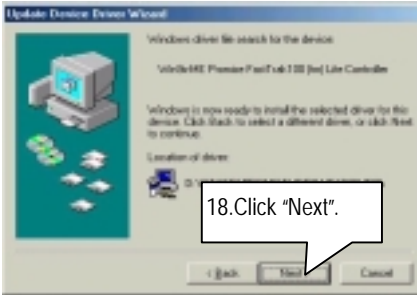
(9)

14.Click "Have Disk".

(10)

16.Click "OK".
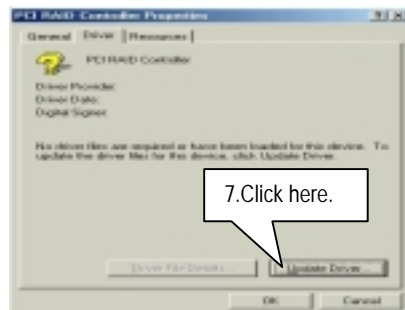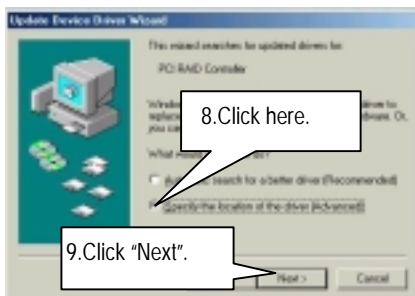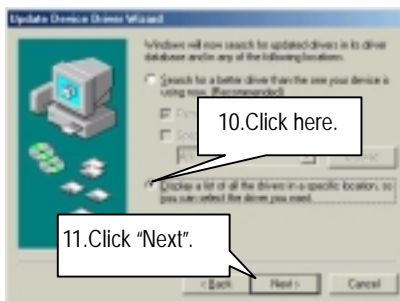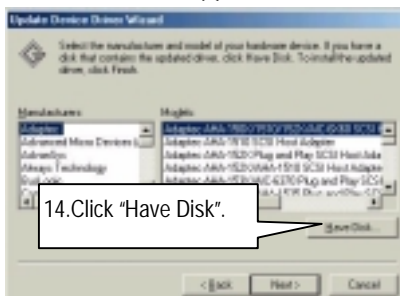
15.Type"D:\Other\Promise\20267\IdeRAID\win9x
-ME"(This manual assumes that your
CD-ROM device drive letter is D:).

(11)

17.Click "Next".
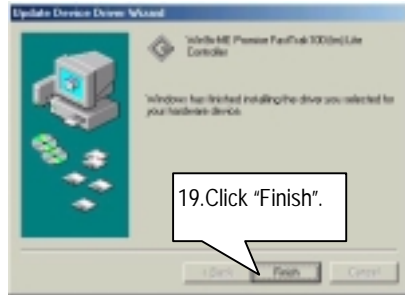
(12)

18.Click "Next".

(13)

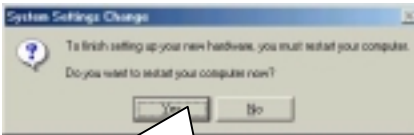19.Click "Finish".

(14)

20.Click "Yes" to restart computer.

(15)

If you want to realize the setup information in detail, please refer to the "Driver Information" for setting your system completely.

C. FastTrak Utilities Installation:

Insert the support CD that came with your motherboard into your CD-ROM driver or double –click the CD driver icon in My Computer to bring up the screen.

2.Click "FastTrak Utilities Installation".

1.Click "Promise PCI Device".

(1)   (2)

3.Click "Next".

(3)   (4)

4.Click "Yes".

5.Click "Next".

(5)   (6)

6.Click "Next".

(7)

7.Click "Next".

(8)

8.Click "Next".

(9)

9.Click "Next".

(10)

10.Click "Next".

(11)

11.Click "Finish" to restart computer.
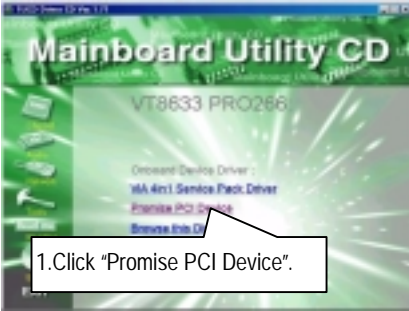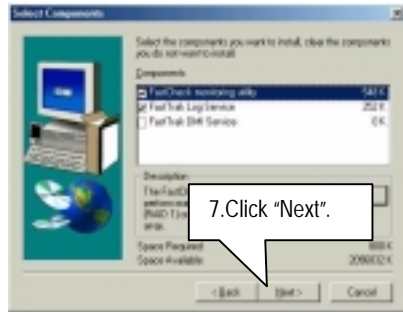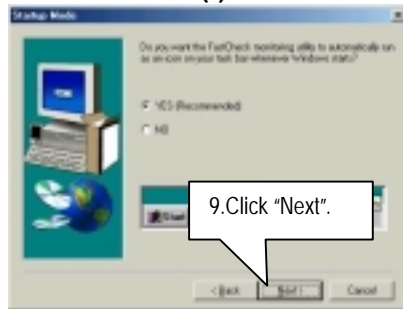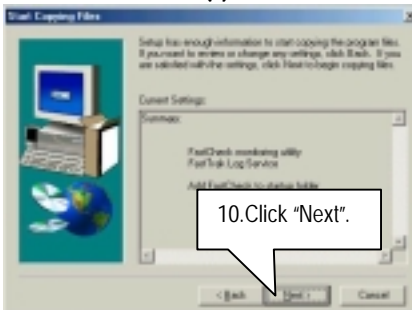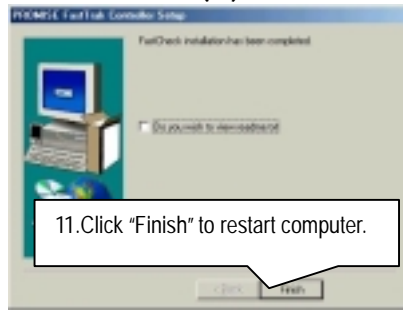
(12)

Appendix C: VIA AC'97 Audio Driver

Insert the support CD that came with your motherboard into your CD-ROM driver or double –click the CD driver icon in My Computer to bring up the screen.

Press "Audio" icon.

VIA AC'97 Audio Driver

1.Click "VIA AC'97 Audio Driver".

(1)

2.Click "Next".

(2)

3.Click "Next".

(3)

4.Click "Next".

(4)

5.Click "OK".

(5)

6.Click "Finish".

(6)

7.Click "Finish" to complete setup.
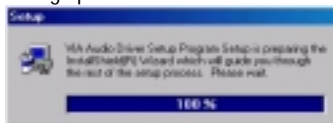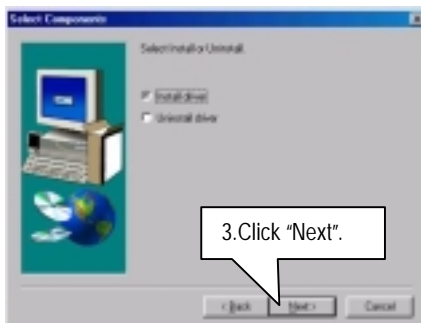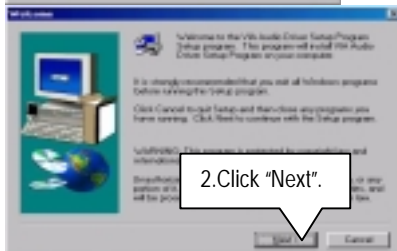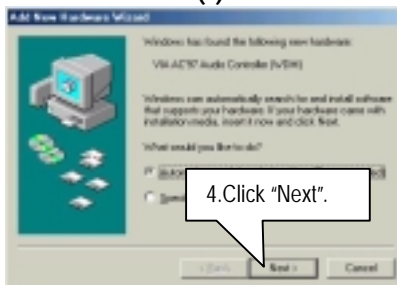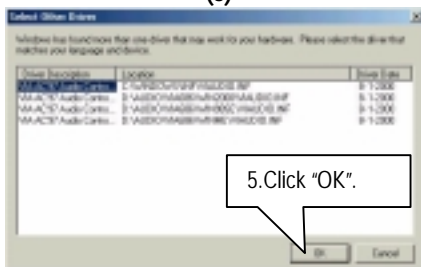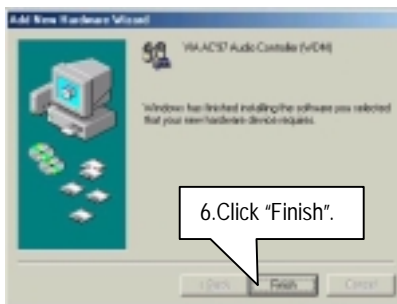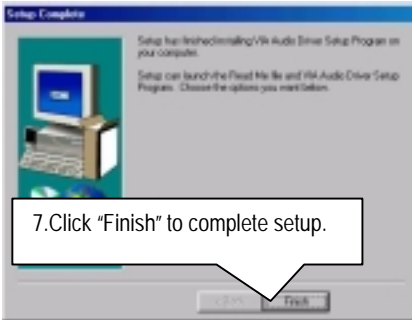
(7)

8. This icon will be shown when driver is completely setup.

(8)

Appendix D: EasyTune**III** Utilities Installation

Insert the support CD that came with your motherboard into your CD-ROM driver or double –click the CD driver icon in My Computer to bring up the screen.
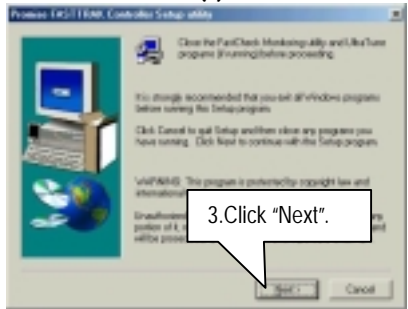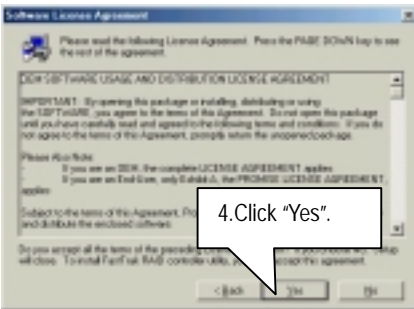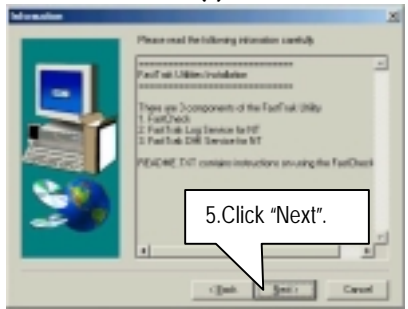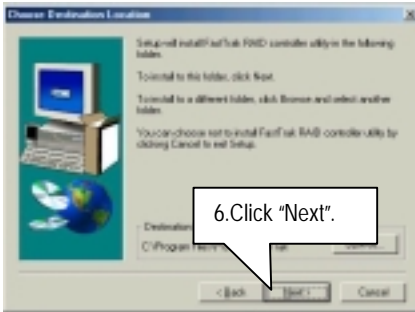

Press "Tools" icon.

1.Click "Gigabyte Utilities".

(1)

2.Click "EasyTuneIII Ver.3.2g".

(2)

3.Click "Next".

(3)

4. Please enter your name and company name, then click "Next".

(4)

5.Click "Next".

(5)

6.Click "Next".

(6)

(7)

7. Click "Finish" to restart computer.
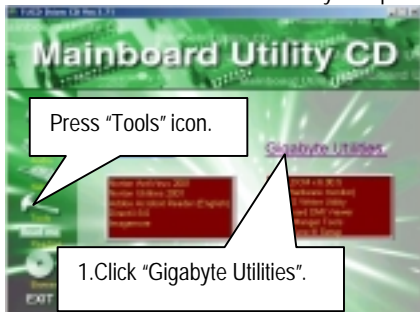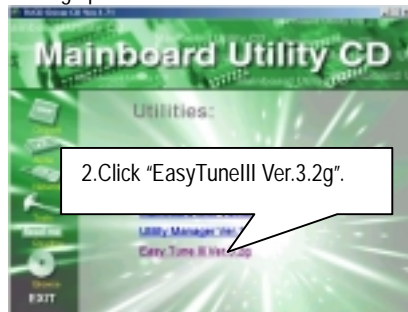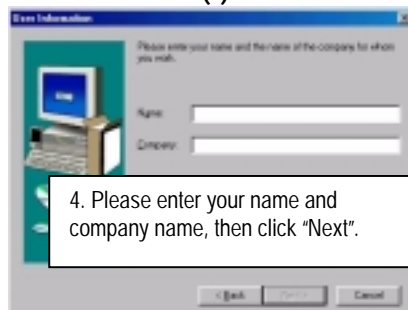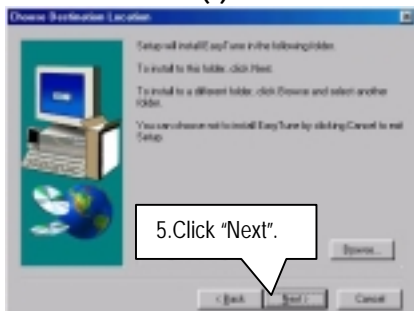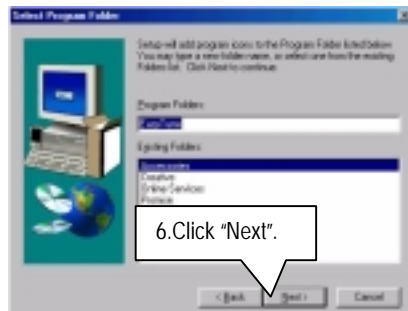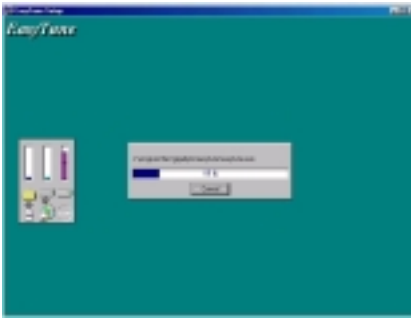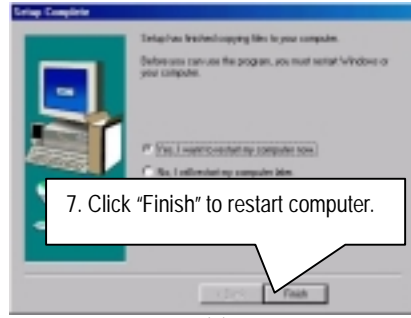
(8)

Appendix E: BIOS Flash Procedure

BIOS update procedure:

If your OS is Win9X, we recommend that you used Gigabyte @BIOS Program to flash BIOS.

Press "Tools" icon.

2.Click "@BIOS Writer v1.06g".

1.Click "Gigabyte Utilities".

(1)   **(2)**

Click "✓".   Click Here.
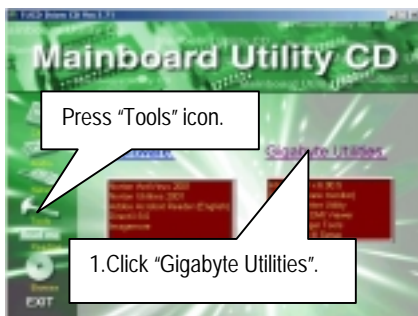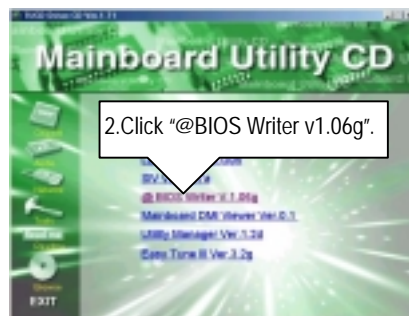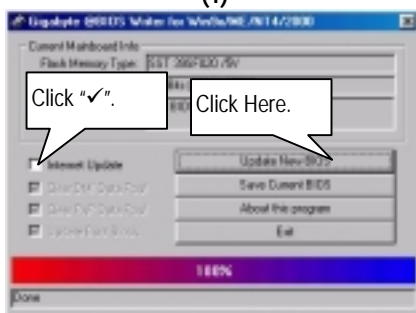
(3)

Methods and steps:

    I. Update BIOS through Internet

        a. Click "Internet Update" icon

        b. Click "Update New BIOS" icon

        c. Select @BIOS sever ("Gigabyte @BIOS sever 1 in Taiwan" and "Gigabyte @BIOS sever 2 in Taiwan" are available for now, the others will be completed soon)

        d. Select the exact model name on your motherboard

        e. System will automatically download and update the BIOS.

II. Update BIOS NOT through Internet :

    a. Do not click "Internet Update" icon

    b. Click "Update New BIOS"

    c. Please select "All Files" in dialog box while opening the old file.

    d. Please search for BIOS unzip file, downloading from internet or any other methods
      (such as: 6RXDW.F1).

    e. Complete update process following the instruction.

III. Save BIOS

    In the very beginning, there is "Save Current BIOS" icon shown in dialog box. It means to
    save the current BIOS version.

IV. Check out supported motherboard and Flash ROM :

    In the very beginning, there is "About this program" icon shown in dialog box. It can help
    you check out which kind of motherboard and which brand of Flash ROM are supported.

Note :

    a. In method I, if it shows two or more motherboard's model names to be selected,
      please make sure your motherboard's model name again. Sellecting name will
      cause the system unbooted.

    b. In method II, be sure that motherboard's model name in BIOS unzip file are the
      same as your motherboard's. Otherwise, your system won't boot.

    c. In method I, if the BIOS file you need cannot be found in @BIOS server, please go
      onto Gigabyte's web site for downloading and updating it according to method II.

    d. Please note that any intercorruption during updating will cause system unbooted

Or else you can select flash BIOS in DOS mode.

Please check your **BIOS vendor (AMI or AWARD)**, your **motherboard name** and **PCB version** on the motherboard.

1. Format a bootable system floppy diskette by the command "**format a:/s**" in command mode.

2. Visit the Gigabyte website at http:// www.gigabyte.com.tw, Select the BIOS file you need and download it to your bootable floppy diskette.

3. Insert the bootable diskette containing the BIOS file into the floppy diskette driver.

4. Assuming that the floppy diskette driver is A, reboot the system by using the A: driver. At the A: > prompt, run the BIOS upgraded file by executing the Flash BIOS utility and the BIOS file with its appropriate extension.

> Example: *(AMI tool) (Where 6rxdw.f1 is name of the BIOS file name)*
> A:>*flashxxx.exe 6rxdw.f1* ↵

> Example: *(Award tool) (Where 6rxdw.f1 is name of the BIOS file name)*
> A:>*wdflash.exe 6rxdw.f1* ↵

5. Upon pressing the <Enter> key, a flash memory writer menu will appear on screen. Enter the new BIOS file name with its extension filename into the text box after file name to program.

6. If you want to save the old BIOS file(perform as soon as system is operational, this is recommended), select Y to **DO YOU WANT TO SAVE BIOS**, then type the old BIOS filename and the extension after filename to save: This option allows you to copy the contents of the flash memory chip onto a diskette, giving you a backup copy of the original motherboard BIOS in case you need to re-install it. Select N to **DO YOU WANT TO SAVE BIOS**, if you don't want to save the old BIOS file.

7. After the decision to save the old BIOS file or not is made, select Y to **ARE YOU SURE TO PROGRAM** when the next menu appear; wait until a message showing Power Off or Reset the system appears. Then turn off your system.

8. Remove the diskette and restart your system.

9. Hold down <Delete> key to enter BIOS setup. You must select "Load Setup BIOS Default" to activate the new BIOS, then you may set other item from the main menu.

Appendix F: Issues To Beware Of When Installing CNR

Please use standard CNR card like the one in order to avoid mechanical problem.
(See Figure A)
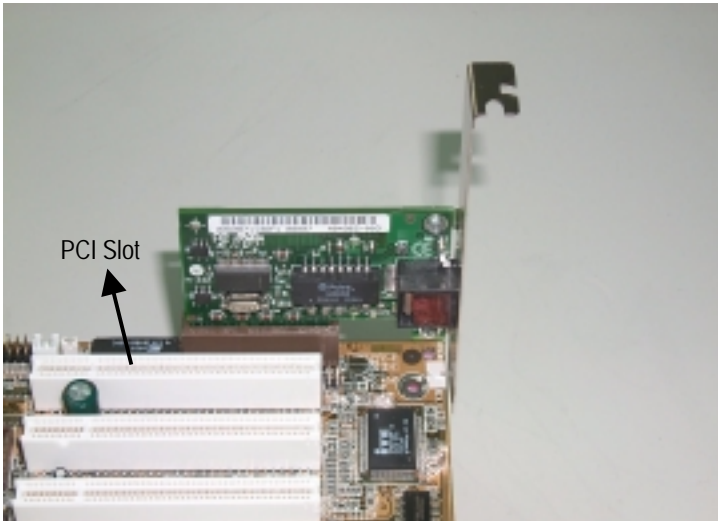
Figure A: Standard CNR Card

Appendix G: Acronyms

Acronyms	Meaning
ACPI	Advanced Configuration and Power Interface
APM	Advanced Power Management
AGP	Accelerated Graphics Port
AMR	Audio Modem Riser
ACR	Advanced Communications Riser
BIOS	Basic Input / Output System
CPU	Central Processing Unit
CMOS	Complementary Metal Oxide Semiconductor
CRIMM	Continuity RIMM
CNR	Communication and Networking Riser
DMA	Direct Memory Access
DMI	Desktop Management Interface
DIMM	Dual Inline Memory Module
DRM	Dual Retention Mechanism
DRAM	Dynamic Random Access Memory
DDR	Double Data Rate
ECP	Extended Capabilities Port
ESCD	Extended System Configuration Data
ECC	Error Checking and Correcting
EMC	Electromagnetic Compatibility
EPP	Enhanced Parallel Port
ESD	Electrostatic Discharge
FDD	Floppy Disk Device
FSB	Front Side Bus
HDD	Hard Disk Device
IDE	Integrated Dual Channel Enhanced
IRQ	Interrupt Request
I/O	Input / Output
IOAPIC	Input Output Advanced Programmable Input Controller
ISA	Industry Standard Architecture
LAN	Local Area Network
LBA	Logical Block Addressing
LED	Light Emitting Diode
MHz	Megahertz
MIDI	Musical Interface Digital Interface
MTH	Memory Translator Hub
MPT	Memory Protocol Translator
NIC	Network Interface Card
OS	Operating System

Acronyms	Meaning
OEM	Original Equipment Manufacturer
PAC	PCI A.G.P. Controller
POST	Power-On Self Test
PCI	Peripheral Component Interconnect
RIMM	Rambus in-line Memory Module
SCI	Special Circumstance Instructions
SECC	Single Edge Contact Cartridge
SRAM	Static Random Access Memory
SMP	Symmetric Multi-Processing
SMI	System Management Interrupt
USB	Universal Serial Bus
VID	Voltage ID

Ultra DMA/ATA100

User Manual

General Description

The *Ultra DMA/ATA100* controller provides two IDE channels that support Ultra ATA/100 protocols, perfect for such demanding applications as real-time video, Multimedia, and high-performance operating systems.

Ultra DMA/ATA100 provides two IDE connectors each support a master/slave combination of IDE devices, including IDE, EIDE, Fast-ATA, and Ultra-ATA standards. Devices of different standards can be connected to *Ultra DMA/ATA100* without performance degradation, due to the independent programmable timing registers in the controller's design.

Features

Performance

- Supports data transfer rates up to 100MB/sec
- Up to 133MB/sec burst transfer rates (through PCI bus)
- CRC checking with Ultra ATA hard drives
- Dual independent channel IDE bus master controller
- Coexists with IDE and SCSI controllers
- With LBA translation and Extended Int 13, supporting IDE hard drives up to 128GB
- Flashable BIOS allows easy upgrades

Hard Drive Installation

WARNING: *If you wish to use your current bootable drive with the Windows NT4 or 2000 operating system on the Ultra DMA/ATA100, do NOT connect this hard drive to the Ultra DMA/ATA100 controller before installing the NT driver. You MUST install the NT or 2000 driver first (see page4, 12) to the boot drive using your existing hard drive controller.*

1. Configure the jumpers of the hard drive you're preparing to connect to the *Ultra DMA/ATA100* using the proper "Master," "Slave," or "Cable-Select" settings. You may need to refer to your hard drive's manual for more information. The instructions here assume you will be installing a single drive on to the Ultra DMA/ATA100 controller.

2. Install the hard drive in the proper hard drive bay of your system.

3. Attach one Ultra ATA cable to each hard drive. Then attach one cable to each of the IDE connectors on the motherboard IDE3&IDE4 connector. The colored edge of the cable(s) indicates pin 1 (see below), and the red cable connector must be attached to the motherboard IDE3 & IDE4 connector.

Red cable connector

Pin 1
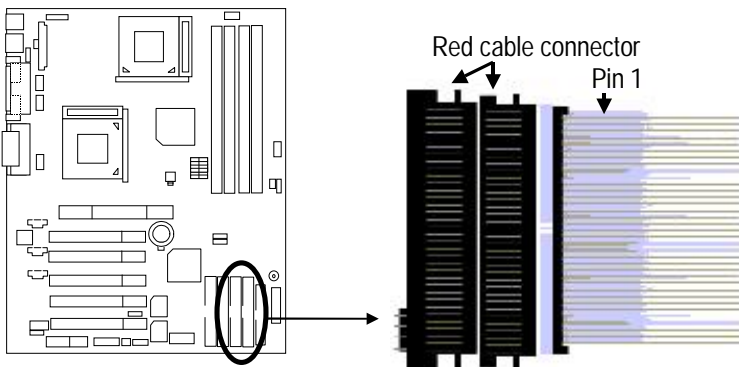
4. Proceed to the Installing Drivers section.

NOTE: *You must use an 80-wire, 40-pin cable when connecting an Ultra ATA/100 hard drive to the Ultra DMA/ATA100 controller.*

Installing Drivers

This section details the Ultra DMA/ATA100 driver installation when used with various operating systems. The software includes the driver necessary to identify Ultra DMA/ATA100 to the operating system.

- For Windows 2000, see below.
- For Windows ME, see page 5
- For Windows 95/98, see page 7.
- For Windows NT4.x, see page 11
- For Windows 3.1/DOS, see page 10.

Windows 2000

Installing Driver During New Windows 2000 Installation

1. Start the system installation by booting from the Windows 2000 disk:

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

    b) 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 "Press F6 if you need to install third party SCSI or RAID driver..." appears.

    c) 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 Ultra DMA/ATA100 driver diskette into drive A: and press "Enter" key.

5. Choose "Win2000 Promise Ultra100[tm] IDE Controller [PR]" 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 Ultra100[tm] IDE Controller [PR]".

    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 7.

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.

Installing Driver in Existing Windows 2000 System

▲ *WARNING*: *If you will be moving the boot drive containing the existing Windows 2000 operating system to motherboard's IDE3 or IDE4 on the Ultra DMA/ATA100 controller, the Ultra DMA/ATA100 driver MUST be loaded to the 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 Ultra DMA/ATA100 controller before completing this step.*

After Enabled the Ultra DMA/ATA100 controller and turn on your system, Windows 2000 setup will show a "New Hardware Found" dialog box. Under Windows 2000, the "PCI Mass Storage Controller" will be displayed.

1. In the dialog box, choose "Driver from disk provided by hardware manufacturer" button.
2. In the A: drive, insert the Ultra DMA/ATA100 driver diskette.
3. Type "A:/WIN2000" in the text box. Press "Enter".
4. Choose "Win2000 Promise Ultra100[tm] IDE Controller [PR]" 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 Ultra100[tm] IDE Controller[PR]". The Ultra DMA/ATA100 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 drives to the Ultra DMA/ATA100 controller (Motherboard's IDE3/IDE4).

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 & RAID Controllers hardware type." The driver "Win2000 Promise Ultra100[tm] IDE Controller [PR]" should appear.

Microsoft Millennium

Installing Drivers During Microsoft Millennium Installation

The following sections detail the installation of the Ultra DMA/ATA100 drivers while installing Windows ME. If you're installing the Ultra DMA/ATA100 drivers on a system with Millennium already installed, see "Installing Drivers with Existing Millennium" on page 6.

1. After installing the hard drives to Ultra DMA/ATA100 controller and configuring the hard drive(s), partition and format your hard drive(s), if necessary.

2. Install Windows ME 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:\WIN9x-ME" in the text box.

11. Insert the "Ultra DMA/ATA100 Driver" diskette into the A: drive.

12. Press the "Next" button. A message informing you that Windows 98/ME has found "WinME Promise Ultra100 (tm) IDE Controller [PD]" 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:

Installing Drivers with Existing Windows ME

The following three sections detail the installation of Ultra DMA/ATA100 drivers on a system that has Windows ME already installed. If you're installing the Ultra DMA/ATA100 drivers on a system during a Windows ME installation, see "Installing Drivers During Windows ME Installation" on page 5.

1. After installing the hard drive(s) to Ultra DMA/ATA100 controller 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. Check the "Search for the best driver for your device" box and click the Next button.

4. Check the "Specify a Location" box and click Next button.

5. Type "A:\WIN9x-ME" in the text box that appears.

6. Insert the "Ultra DMA/ATA100 Driver" diskette in drive A:.

7. Click on "Next." The Add New Hardware wizard will say it has found "WinME Promise Ultra100 (tm) IDE Controller [PD]".

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 ME

To confirm that the driver has been properly loaded in Windows ME, 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 & RAID controllers." "WinME Promise Ultra100 (tm) IDE Controller [PD]" should appear

Windows 95/98

Installing Drivers During Windows 95/98 Installation

The following sections detail the installation of the Ultra DMA/ATA100 drivers while installing Windows 95/98. If you're installing the Ultra DMA/ATA100 drivers on a system with Windows 95/98 already installed, see "Installing Drivers with Existing Windows 95/98" on page 9.

Windows *98*

1. After installing the hard drives to Ultra DMA/ATA100 controller 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:\WIN9x-ME" in the text box.

11. Insert the "Ultra DMA/ATA100 Driver" diskette into the A: drive.

12. Press the "Next" button. A message informing you that Windows 98/ME has found "WinME Promise Ultra100 (tm) IDE Controller [PD]" 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:.

Windows 95

1. After installing the hard drives to Ultra DMA/ATA100 controller and configuring the hard drives, partition and format your hard drive(s), if necessary.

2. Install Windows 95 normally.

3. After installation, go to 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, and then press the "Update Driver" button.

9. When asked if you want Windows to search for the driver, choose "Yes (recommended)."

10. Insert the "Ultra DMA/ATA100 Driver" diskette into the A: drive, then press "Next."

11. When Windows informs you that it was unable to find the drivers, press "Other Locations…"

12. In the "Select Other Location" dialog box, type "A:\WIN9x-ME".

13. Press the "Next" button. A message informing you that Windows 95 has found "WinME Promise Ultra100 (tm) IDE Controller [PD]" should appear.

14. Press "Finish." (If Windows can't find the "Ultra.MPD" file, type "A:\WIN9x-ME" in the "Copy files from:" text box).

15. Choose "Yes" when asked if you wish to restart the system, and remove the diskette.

Installing Drivers with Existing Windows 95/98

The following sections detail the installation of Ultra DMA/ATA100 drivers on a system that has Windows 95/98 already installed. If you're installing the Ultra DMA/ATA100 drivers on a system during a Windows 95/98 installation, see "Installing Drivers During Windows 95/98 Installation" on page 7.

Windows 98

1. After installing the hard drive(s) to Ultra DMA/ATA100 controller 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. Check the "Search for the best driver for your device" box and click the Next button.

4. Check the "Specify a Location" box and click Next button.

5. Type "A:\WIN9x-ME" in the text box that appears.

6. Insert the "Ultra DMA/ATA100 Driver" diskette in drive A:.

7. Click on "Next." The Add New Hardware wizard will say it has found "WinME Promise Ultra100 (tm) IDE Controller [PD]".

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:.

Windows 95

1. After installing the hard drives to Ultra DMA/ATA100 controller and configuring the hard drives, power up the system and boot Windows.

2. The "Update Device Drive Wizard" will appear, informing you that it has found a "PCI Mass Storage Controller."

3. Insert the "Ultra DMA/ATA100 Driver" diskette in drive A: .

4. Type "A:\WIN9x-ME" in the text box, then click on "Next." Windows will inform you that it has found the "WinME Promise Ultra100 (tm) IDE Controller [PD]".

5. Click on "Finish," and when prompted to insert the "Ultra DMA/ATA100 Driver" diskette, click on "OK."

6.   If a message informing you that the file "Ultra.MPD" cannot be found, go to the "Copy files from:" text box and type: "A:\WIN9x-ME".

7.   Choose "Yes" when asked whether you want to restart your computer. Be sure to remove the diskette from drive A

Confirming Driver Installation in Windows 95/98

To confirm that the driver has been properly loaded in Win 9x/ME, 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 & RAID controllers." "WinME Promise Ultra100 (tm) IDE Controller [PD]" should appear

DOS/Windows 3.1x

For first-time installation, follow the standard procedure of installing DOS on to your hard disk (partition all hard drives with FDISK and format before performing the following procedure):

1.   Insert "Disk 1" of your DOS installation diskettes into drive A:.

2.   Type "A:SETUP" at the "A:\" prompt.

3.   Continue with normal DOS installation procedure, and refer to your DOS manual for additional details.

NOTE: The Ultra DMA/ATA100 BIOS supports both DOS and Windows 3.1x without software drivers.

Windows NT4

Installing Drivers During 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 inspecting 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 Ultra DMA/ATA100 driver diskette into drive A: and press the "Enter" key.

5. Choose "WinNT Promise Ultra100 (tm) IDE Controller [PD]" 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 "WinNT Promise Ultra100 (tm) IDE Controller [PD]".

    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 7.

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 Ultra100 (tm) IDE Controller [PD]" driver has been installed.

Installing Driver with Existing Windows NT 4.0

WARNING: *If you plan to move your boot drive to motherboard's IDE3 or IDE4, hard drives should NOT be connected to the Ultra DMA/ATA100 before performing the following procedure. The Ultra DMA/ATA100 drivers must be loaded on the system hard drive (running under the existing hard drive controller) before any hard drives are connected to the Ultra DMA/ATA100 controller.*

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 "Ultra DMA/ATA100 Driver" diskette in drive A:.

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

8. When the "Install Driver" dialog box appears, select "WinNT Promise Ultra100 (tm) IDE Controller [PD]" 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 Ultra100 (tm) IDE Controller [PD]" has been installed.

11. Power off your system.

12. If moving the boot drive to the Ultra DMA/ATA100 controller (Motherboard's IDE3, IDE4), now attach the hard drives otherwise reboot.

Removing the Driver from Windows NT 4.x

1. In "Start" Button choose "Control Panel" in "Setup" group.

2. In "Control Panel," select "SCSI Adapter," next choose "Drivers" label

3. Choose "Remove" button.

4. After successful removing, the "SCSI Adapter Setup" box will show that "WinNT Promise Ultra100 (tm) IDE Controller [PD]" has been removed.

Troubleshooting

Problem:

The following warning appears in the Ultra DMA/ATA100 BIOS: " [WARNING] BECAUSE OF 40-CONDUCTOR CABLE(S) USED, Dx WOULD BE DOWN TO ULTRA33 MODE. PLEASE USE 80-CONDUCTOR CABLE(S) IF ULTRA DMA/ATA100 WANTED".

Solution:

A 40-wire, 40-pin IDE cable is being used with an Ultra ATA/100 capable hard drive in the Ultra DMA/ATA100 hard drive setup. To access Ultra ATA/100 timing (and take advantage of the full capabilities of your Ultra ATA/100 hard drive), you must use an 80-wire, 40-pin IDE cable. One 80-wire, 40-pin cable is included with the Ultra DMA/ATA100 package. The colored edge of the cable(s) indicates pin 1 and the red cable connector must be attached to the Ultra DMA/ATA100 connector.

Problem:

Determining hard drive performance.

Solution:

During the ***Ultra DMA/ATA100*** BIOS, the maximum transfer rate timing of the hard drive(s) connected to the Ultra DMA/ATA100 controller will be displayed next to the model name of the hard drive. Example: "D1 QUANTUM FIREBALL CR8.4A LBA 8056MB ULTRA DMA 5." "D1" identifies drive 1 (master drive on the primary IDE port 1 on the Ultra DMA/ATA100 controller); "QUANTUM FIREBALL CR8.4A" represents the model name/number; "LBA" signifies that the drive size is being translated so that the system can make use of the drive's full capacity; "8056MB" represents the drive'scapacity; "ULTRA DMA 5" identifies the maximum transfer rate. Slower transfer rates include: "ULTRA DMA (0, 1, 2, 3, or 4)"; "DMA (0, 1, 2, or 3)"; "PIO (0, 1, 2, 3, or 4)." To make full use of the performance enhancements of Ultra DMA/ATA100, use only Ultra DMA 5 drives.

Problem:

FDISK reports a much lower drive capacity if a single drive exceeds 64GB

Solution:

Due to a limitation with FDISK, the utility reports only the storage capacity that exceeds 64GB. This is a cosmetic, not actual, limitation. Simply create a single DOS drive partition, reboot, then format the partition. The Format command will recognize the total capacity of the partition accurately. Windows NT/2000/98 will now recognize the total capacity of your drive.

Problem:
While booting Windows NT4.0 or 2000 during a floppy less install, the message "Inaccessible Boot Device" appears.
Solution:
The "F6" key was not pressed at the appropriate time. Reboot the system, and press the "F6" key when the message "Setup is inspecting your computer's hardware configuration…" appears in Windows NT4 or the message "Press F6 if you need to install third party SCSI or RAID driver" appears in Windows 2000.

Problem:
While booting Windows NT 4.0 or Windows 2000 during a CD-ROM disk install, the message "No Hard Drives Found" appears.
Solution:
The "F6" key was not pressed at the appropriate time. Reboot the system, and press the "F6" key when the message "Setup is inspecting your computer's hardware configuration…" appears or the message "Press F6 if you need to install third party SCSI or RAID driver" appears in Windows 2000.

User Manual

Table of Contents

Introduction

What is the FastTrak100 RAID controller?

Promise designed its FastTrak100 to provide a cost-effective, high performance RAID controller 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) or 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/100 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) to and RAID 0+1 mirroring and striping (for four drives) 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.

Keys Features and Benefits

The following information offers an overview of the major features of your new Promise FastTrak100. It is divided into two areas: Advanced Hardware Design, and Compatibility.

Advanced Hardware Design	
Features	**Benefits**
Supports data striping (RAID 0) or mirroring (RAID 1), and striping/mirroring combination (RAID 0+1)	Provides dramatic increase in drive performance and/or fault tolerant options. Offers performance customization and data rebuilds from the BIOS menu.
Supports Ultra DMA 5/4/3/2/1/0, DMA 2/1/0	Burst data transfer rates up to 100MB/sec from Ultra ATA/100 drives to boost overall system performance.
PCI Plug-n-Play, PCI Interrupt sharing and coexists with motherboard IDE controllers	Easy to install; support four ATA drives on the FastTrak100 while still supporting 4 devices on motherboard ATA controller.
Supports concurrent dual IDE controller operation	Drive workload is distributed in parallel between members of the array.
Supports IDE bus master operation	Allows multitasking during disk transfers which increase CPU efficiency. The CPU is free to process tasks during IDE data transfers through the PCI Bus to/from system memory.
Utilizes FastBuild^{TM} auto-menu from the FastTrak100 BIOS	Offers pre-set application specific settings which can be optimized for Desktop, Server, or A/V Editing. Has "Auto Setup" option for quick and easy array builds.
Displays status and error checking messages during boot-up	Notifies user of possible errors and allows for recovery of mirrored drive arrays directly from FastBuild^{TM}.
Employs the latest Promise PCI Ultra ATA/100 ASIC technology.	Fully supports Ultra ATA/100 specifications with 100 MB/sec timing and CRC error-checking at high speeds.
Mirroring supports automatic background rebuilds	Fault tolerance can be restored automatically without rebooting

Compatibility	
Features	**Benefits**
Complies with PCI v2.1 Local Bus standard	Provides highest level of hardware compatibility.
Compliant with PCI IDE Bus Master standard. PCI IDE Bus Master support for Windows 98/95, Windows NT 3.5x, 4.0	Provides 32-bit I/O, IDE Bus Master, and Ultra ATA performance for optimal system performance.
Tested compatibility to coexist with motherboards that have integrated IDE controllers	Improves system performance of new and existing installations including motherboard with Intel chipsets.
Compatible with Ultra ATA/100, Ultra ATA/66, Ultra ATA/33, EIDE	Works with newest and current IDE drive specifications. Promise engineers experienced with IDE devices perform verification testing with major drive manufacturers and development partners.
Features LBA and Extended Interrupt13 drive translation in controller onboard BIOS	Breaks capacity barriers for support of drives greater than 8.4GB in capacity. Offers flexible storage options for space demanding applications.

Getting Started

This section is designed to get you started for installation of your FastTrak100.

WARNING: Before installing the driver into an existing system, backup any necessary data. Failure to follow this accepted PC practice could result in data loss.

Installing The Hard Drives

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 26) to this drive while it is still attached to your existing hard drive controller.

Hard drives must be Ultra ATA/100, Ultra ATA/66, Ultra ATA/33, EIDE and/or Fast ATA-2 compatible to operate with the FastTrak100 RAID Controller. For optimal performance, install all **identical** drives of the same model and capacity. The drives' **matched performance** allows the array to function better as a single drive.

1. Promise recommends using identical drive as part of a FastTrak100 array. If striping for performance, use up to four new drives. If mirroring for protection, you can use two new drives OR use an existing drive and a new drive (the new drive must be the same size or larger than the existing drive).

2. Configure the jumpers of the hard drive you're preparing to connect to the FastTrak100 using the correct "Master / Slave" or
"Cable-Select" settings in the positions described in the table below.

   NOTE: Sometimes the Master drive with no slave attached is called "Single." The master slave setting differentiates two drives chained on the same connector.

Jumper Settings		
# of Drives	IDE Channel 1	IDE Channel 2
1	M	----
2	M	M
3	M & S	M
4	M & S	M & S

M = Master, S = Slave

3. Install the hard drives into the hard drive bays of your system, including the power cables.

4. Attach one Ultra ATA cable to each hard drive. Then attach one cable to each of the IDE connectors on the motherboard IDE3&IDE4 connector. The colored edge of the cable(s) indicates pin 1 (see below), and the red cable connector must be attached to the motherboard IDE3 & IDE4 connector.

Red cable connector

Pin 1
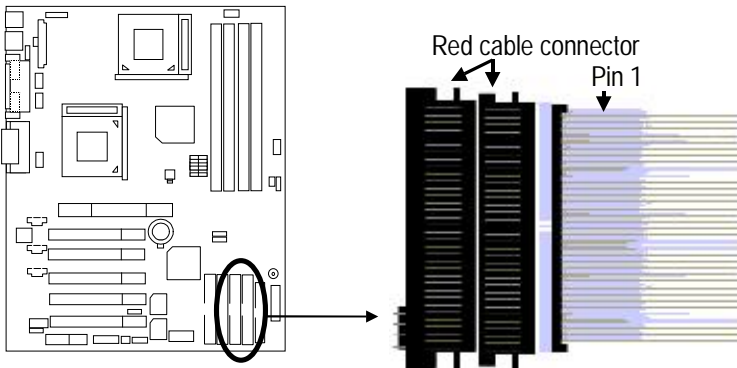
NOTE: You must use an 80-wire, 40-pin cable when connecting an Ultra ATA/100 hard drive to the motherboard IDE3 & IDE4 connector.

Checking CMOS Settings

No changes are necessary in the Mainboard CMOS Setup for resources or drive types. Since FastTrak100 is a PCI Plug-n-Play (PnP) device, the Interrupt and Port address resources are automatically assigned by the Mainboard's PCI PnP BIOS.

The FastTrak100 system resources including port address, interrupt, and BIOS address are **automatically** determined by the system PnP BIOS. To customize IRQ settings, enter the Mainboard BIOS's Advanced PCI setup and follow the manufacturer's procedures. When the system is limited by IRQ resources, the FastTrak100 controller can be set for the same IRQ as other PCI cards that support PCI interrupt sharing.

For the FastTrak100 to be the bootable IDE controller, confirm in the mainboard's Standard CMOS Setup that the drive types (for hard disk drives) are set for "Unknown Device" or "Not Installed" (see below). If there is a "Hard-Disk Drive Sequence," place the FastTrak100 controller as the second choice in searching for a bootable device. No changes are needed for CD-ROM drives that are attached to the mainboard IDE controller.

Processor ID: MHz	BIOS version: xxx
Cache:	Server Tag: xxxxx

System Time	18:50:37
System Date	Tue May 02, 2000
Diskette Drive A:	3.5 inch, 1.44 MB
Diskette Drive B:	Not Installed
Primary Drive 0	Unknown Device
Primary Drive 1	Unknown Device
Secondary Drive 0	CD-ROM Reader
Secondary Drive 1	Unknown Device
Hard-Disk Drive Sequence	<ENTER>
Boot Sequence	<ENTER>

Creating Your Disk Array

You will now use the 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.

WARNING: If creating a Security array using an existing hard drive, backup any necessary data. Failure to follow this accepted PC practice could result in data loss.

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

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

   No array defined . . .

Press <Ctrl-F> to enter FastBuild (tm) Utility
Or press <ESC> key to continue booting the system.

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.

```
         FastBuild (tm) Utility 1.xx (c) 1995-2000 Promise Technology, Inc.
                          [Auto Setup Options Menu]


         Optimize Array for:                 Performance
         Typical Application usage:          A/V Editing

                          [ Auto Setup Configuration ]

         Mode.......................................................Stripe
         Drives used in Array ...................................... 2
         Array Disk Capacity ............................... 16126


                              [ Keys Available ]

      [↑] Up [↓] Down   [←, →, Space] Change Option   [ESC] Exit   [Ctrl-Y] Save
```
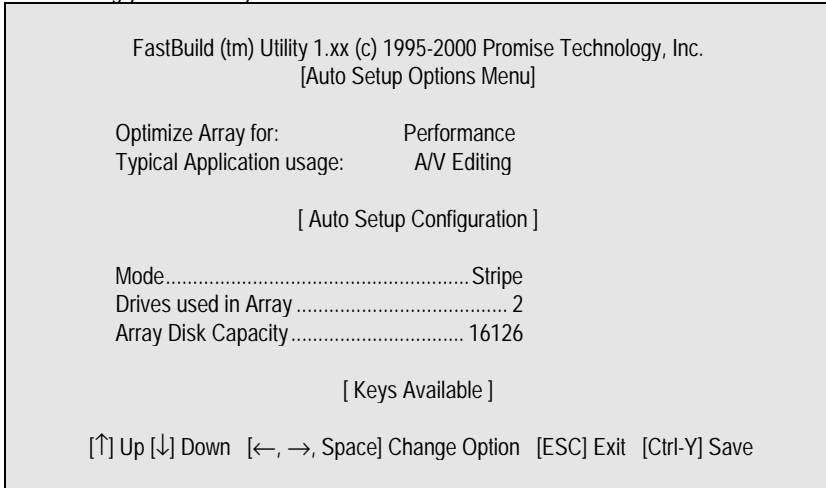
Creating an Array for Performance

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 (see page 26).

Creating a Security Array With New Drives

NOTE: FastTrak100 permit only two drives to be used for a single Mirrored array 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.

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

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 26 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 it, the mirroring option will not be available at all in auto setup.

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 page 26) 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 :Master QUANTUMCR8.4A                  8063
 2 :Master QUANTUMCR8.4A                  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 26 to install the FastTrak100 driver and/or operating system.

Using FastBuild™ Configuration Utility

The FastBuild^{TM} Configuration Utility offers several menu choices to create and manage the drive array on the Promise FastTrak100 controller. 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 and drives installed, the Promise onboard BIOS will detect the drives attached and show the following screen.

```
FastTrak100 (tm) BIOS Version 1.xx (Build xx)
(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 controller'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    SIZE     TRACK-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 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^{TM} Setup.

```
        FastBuild (tm) Utility 1.xx (c) 1995-2000 Promise Technology, Inc.
                              [ Main Menu ]


        Auto Setup...............................................[ 1 ]
        View Drive Assignments...........................[ 2 ]
        View Array ...........................................[ 3 ]
        Delete Array..........................................[ 4 ]
        Rebuild Array.........................................[ 5 ]
        Controller Configuration..........................[ 6 ]



                           [ Keys Available ]
                Press 1...6 to Select Option   [ESC] Exit
```
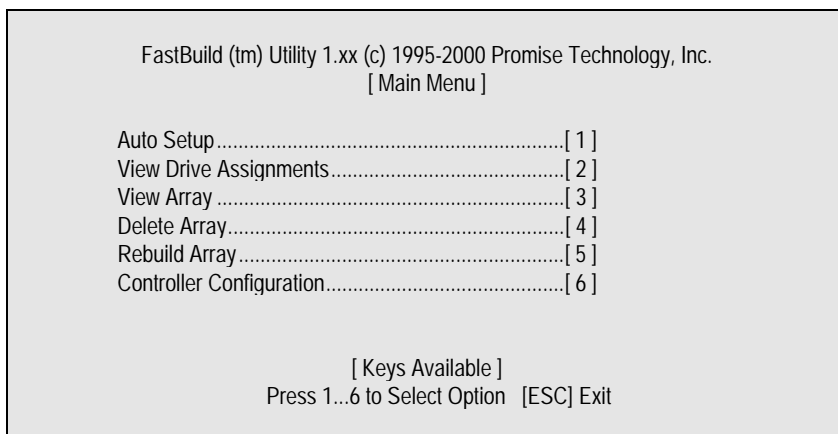
To create a new array automatically, follow the steps under "Creating Arrays Automatically" on page 12. Promise recommends this option for most users.

To manually create an array or define an array as bootable, follow the steps under "Manually Creating Arrays" on page 15. 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 14.

To delete an array (but not delete the data contained on the array), select "Deleting An Array" on page 21.

To rebuild a mirrored array, see "Rebuilding an Array" on page 23.

To view controller settings, see "Viewing Controller Configuration" on page 25.

NOTE: After 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.

```
          FastBuild (tm) Utility 1.xx (c) 1995-2000 Promise Technology, Inc.
                              [Auto Setup Options Menu]

          Optimize Array for:                  Performance
          Typical Application usage:          A/V Editing

                              [ Auto Setup Configuration ]

          Mode......................................................Stripe
          Spare Drive Count .......................................... 1
          Drives used in Array ....................................... 2
          Array Disk Capacity ................................ 16126

                                  [ Keys Available ]

          [↑] Up [↓] Down   [←, →, Space] Change Option   [ESC] Exit   [Ctrl-Y] Save
```
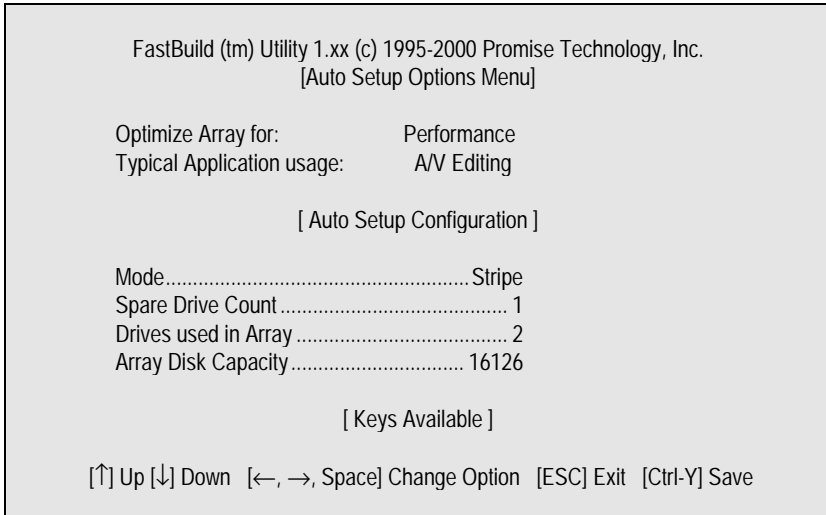
Optimize Array For

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 controller 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 controller will support a maximum of four arrays[1].

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 controller 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 52 about RAID levels.

```
        FastBuild (tm) Utility 1.xx (c) 1995-2000 Promise Technology, Inc.
                         [ Define Array Definition 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
1 : Slave       QUANTUMCR8.4A              8063              N
2 : Master      QUANTUMCR8.4A              8063              Y


                            [ Keys Available ]

         [↑] Up [↓] Down   [ESC] Exit   [Space] Select   [Ctrl-Y] Save
```

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 26) 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 : Master	QUANTUMCR8.4A	8063
2 : Master	QUANTUMCR8.4A	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

10% Complete
```
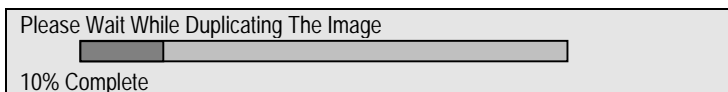
7.   Once mirroring is complete, the following screen will appear confirming that your Security array has been created. Press any key to reboot the system

```
          Array has been created.
          <Press Any Key to Reboot>
```
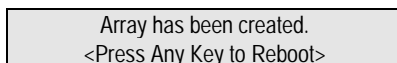
Making a FastTrak100 Disk Array Bootable

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
```
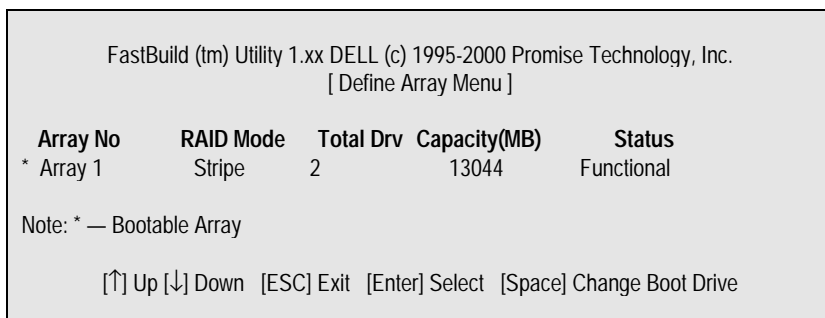
2.   Highlight the array which you want to boot from using the [↑] Up [↓] Down keys.

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 controller 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.

```
        FastBuild (tm) Utility 1.xx (c) 1995-2000 Promise Technology, Inc.
                             [ Delete Array Menu ]

 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.

2.   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
```

3. 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

4. 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.
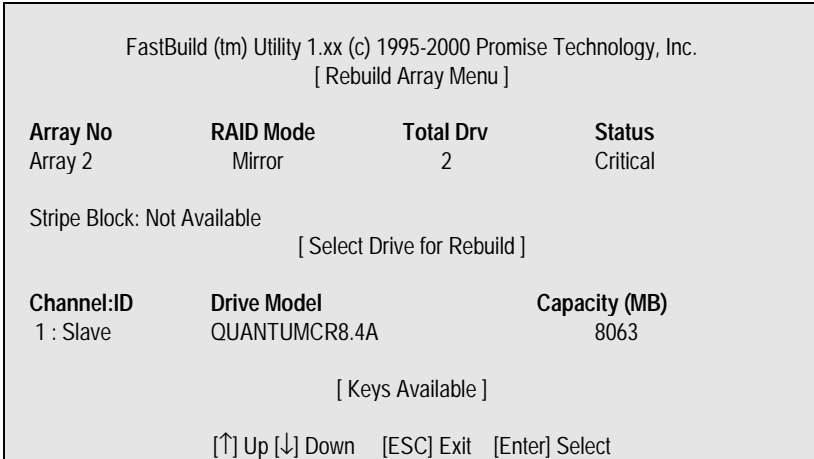
NOTE: Drives MUST be replaced if they contain any physical errors.

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".

10.   Press [Enter]. The following screen will then appear (see next page).

```
           FastBuild (tm) Utility 1.xx (c) 1995-2000 Promise Technology, Inc.
                              [ Rebuild Array Menu ]

  Array No            RAID Mode           Total Drv           Status
  Array 2             Mirror              2                   Critical

  Stripe Block: Not Available
                          [ Select Drive for Rebuild ]

  Channel:ID          Drive Model                   Capacity (MB)
   1 : Slave          QUANTUMCR8.4A                      8063

                              [ Keys Available ]

               [↑] Up [↓] Down    [ESC] Exit   [Enter] Select
```
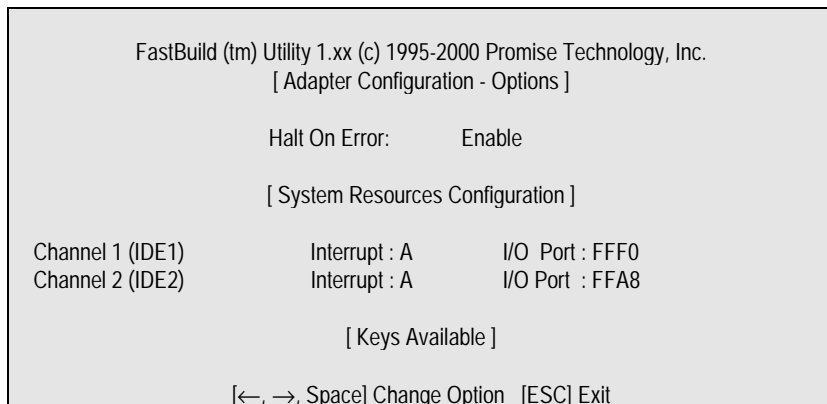
11. Under [Select Drive for Rebuild], highlight the replacement drive.

12. Press [Enter] and confirm that the data will be copied on to the selected drive. All data on the replacement drive will be written over with mirrored information from the array drive. A progress bar will appear as below.

```
  Please Wait While Duplicating The Image
  [████████                                    ]
  10% Complete
```
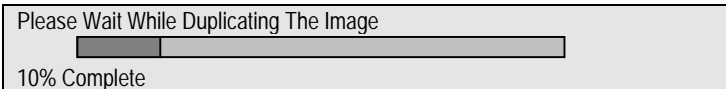
13. Once the rebuild process is complete, the user will be asked to reboot the system.

Viewing Controller Settings

The Controller Configuration <6> menu selection allows you to enable or disable the FastTrak100 BIOS from halting (the default) if it detects an error on boot up. You may also view the system resources (Interrupt and I/O port address) of FastTrak's data channels.

```
         FastBuild (tm) Utility 1.xx (c) 1995-2000 Promise Technology, Inc.
                       [ Adapter Configuration - Options ]

                      Halt On Error:          Enable

                      [ System Resources Configuration ]

   Channel 1 (IDE1)          Interrupt : A        I/O  Port : FFF0
   Channel 2 (IDE2)          Interrupt : A        I/O Port  : FFA8

                           [ Keys Available ]

            [←, →, Space] Change Option   [ESC] Exit
```

Halting FastTrak BIOS On Bootup Errors

The [Adapter Configuration – Options] section allows you to enable or disable FastTrak100 to Halt operation at the BIOS startup screen should an error be detected. This is the only option that can be changed on this screen.

Viewing FastTrak System Resources

The [System Resources Configuration] section of this submenu displays the PCI slot interrupt and port address used by the FastTrak100. The resources used are determined by the Mainboard PCI PnP BIOS for the PCI slot in which the FastTrak100 resides.

In the rare case that there is a resource conflict, refer to the Mainboard BIOS documentation on changes on resources allocated to the FastTrak100 controller.

Installing Drivers

This section details the FastTrak100 driver installation when used with various operating systems. The software includes the driver necessary to identify FastTrak100 to the operating system.

- For Windows 2000, see below.
- For Windows 9x/ME, see page 28.
- For Windows NT4.x, see page 32
- For Windows 3.1/DOS, see page 31.

Windows 2000

Installing Driver During New Windows 2000 Installation

1. Start the system installation by booting from the Windows 2000 disk:

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

    b) 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.

    c) 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 (tm) 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 (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 7.

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.

Installing Driver in Existing Windows 2000 System

WARNING: If you will be moving the boot drive containing the existing Windows 2000 operating system to a mirrored RAID 1 array on the FastTrak100 controller, the FastTrak100 driver MUST be loaded to the 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 before completing this step.

After Enabled the FastTrak100 controller and rebooting your system, Windows 2000 setup will show a "New Hardware Found" dialog box. Under Windows 2000, the "PCI RAID Controller" will be displayed.

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 (tm) 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 (tm) 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 drives to the FastTrak100 controller (IDE3/IDE4).

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 & RAID Controllers hardware type." The driver "Win2000 Promise FastTrak100 (tm) Controller" should appear.

Windows 9x/ME

Installing Drivers During Windows 9x/ME Installation

The following three sections detail the installation of the FastTrak100 drivers while installing Windows 9x/ME. If you're installing the FastTrak100 drivers on a system with Windows 9x/ME already installed, see "Installing Drivers with Existing Windows 9x/ME" on page 30.

Windows 98/ME

1. After installing the hard drives to FastTrak100 controller and configuring the hard drive(s), partition and format your hard drive(s), if necessary.

2. Install Windows 98 or Windows ME 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 RAID 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:\WIN9x-ME" 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 98/ME has found "Win9x-ME Promise FastTrak100 (tm) 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:.

Windows 95

1. After installing the hard drives to FastTrak100 controller and configuring the hard drives, partition and format your hard drive(s), if necessary.

2. Install Windows 95 normally.

3. After installation, go to 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, and then press the "Update Driver" button.

9. When asked if you want Windows to search for the driver, choose "Yes (recommended)."

10. Insert the "FastTrak100 Driver" diskette into the A: drive, then press "Next."

11. When Windows informs you that it was unable to find the drivers, press "Other Locations…"

12. In the "Select Other Location" dialog box, type "A:\WIN9x-ME".

13. Press the "Next" button. A message informing you that Windows 95 has found "Win9x-ME Promise FastTrak100 (tm) Controller" should appear.

14. Press "Finish." (If Windows can't find the "FastTrak100.MPD" file, type "A:\WIN9x-ME" in the "Copy files from:" text box).

15. Choose "Yes" when asked if you wish to restart the system, and remove the diskette.

Installing Drivers with Existing Windows 9x/ME

The following three sections detail the installation of FastTrak100 drivers on a system that has Windows 9x/ME already installed. If you're installing the FastTrak100 drivers on a system during a Windows 9x/ME installation, see "Installing Drivers During Windows 9x/ME Installation" on page 28.

Windows 98/ME

1. After installing the hard drive(s) to FastTrak100 controller 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 RAID Controller."

3. Check the "Search for the best driver for your device" box and click the Next button.

4. Check the "Specify a Location" box and click Next button.

5. Type "A:\WIN9x-ME" in the text box that appears.

6. Insert the "FastTrak100 Driver" diskette in drive A:.

7. Click on "Next." The Add New Hardware wizard will say it has found "Win9x-ME Promise FastTrak100 (tm) controller".

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:.

Windows 95

1. After installing the hard drives to FastTrak100 controller and configuring the hard drives, power up the system and boot Windows.

2. The "Update Device Drive Wizard" will appear, informing you that it has found a "PCI Mass Storage Controller."

3. Insert the "FastTrak100 Driver" diskette in drive A:.

4. Type "A:\WIN9x-ME" in the text box, then click on "Next." Windows will inform you that it has found the "Win9x-ME Promise FastTrak100 (tm) controller".

5. Click on "Finish," and when prompted to insert the "FastTrak100 Driver" diskette, click on "OK."

6. If a message informing you that the file "FastTrak100.MPD" cannot be found, go to the "Copy files from:" text box and type: "A:\WIN9x-ME".

7. Choose "Yes" when asked whether you want to start your computer. Be sure to remove the diskette from drive A

Confirming Driver Installation in Windows 9x/ME

To confirm that the driver has been properly loaded in Win 9x/ME, 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 & RAID controllers." "Win9x-ME Promise FastTrak100 (tm) controller " should appear

DOS/Windows 3.1x

For first-time installation, follow the standard procedure of installing DOS on to your hard disk (partition all hard drives with FDISK and format before performing the following procedure):

1. Insert "Disk 1" of your DOS installation diskettes into drive A:.

2. Type "A:SETUP" at the "A:\" prompt.

3. Continue with normal DOS installation procedure, and refer to your DOS manual for additional details.

NOTE: The FastTrak100 BIOS supports both DOS and Windows 3.1x without software drivers.

Windows NT4

Installing Drivers During 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 inspecting 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 FastTrak100 driver diskette into drive A: and press the "Enter" key.

5. Choose "Win NT 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 "Win NT 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 7.

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 "Win NT Promise FastTrak100 (tm) Controller" driver has been installed.

Installing Driver with Existing Windows NT 4.0

WARNING: If you plan to move your boot drive to a mirrored RAID 1 FastTrak array, hard drives should NOT be connected to the FastTrak100 controller before performing the following procedure. The FastTrak100 drivers must be loaded on the system hard drive (running under the existing hard drive controller) before any hard drives are connected to the FastTrak100 controller.

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 window, then choose "OK."

8. When the "Install Driver" dialog box appears, select "Win NT 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 "Win NT Promise FastTrak100 (tm) Controller" has been installed.

11. Power off your system.

12. If moving the boot drive to the FastTrak100, now attach the hard drives otherwise reboot.

Removing the Driver from Windows NT 4.x

1. In "Start" Button choose "Control Panel" in "Setup" group.

2. In "Control Panel," select "SCSI Adapter," next choose "Drivers" label

3. Choose "Remove" button.

4. After successful removing, the "SCSI Adapter Setup" box will show that "Win NT Promise FastTrak100 (tm) Controller" has been removed.

Using The FastCheck™ Monitoring Utility

You can monitor the operating status of all arrays and drives configured on the FastTrak100 using the supplied FastCheck monitoring utility for Windows-based operating systems. FastCheck generates visual and audible messages alerting you of possible problems with the disk array or controller.

FastCheck visually identifies the physical location of attached drives on the FastTrak100 by IDE channel (3 or 4) and setting (Master/Slave/Cable-Select). It also displays which drives are included as part of individual arrays. Administrators can customize FastCheck to maintain operating logs and event notification, set Password access to the utility, and schedule maintenance on Mirrored (RAID 1) or a Striped/Mirrored (RAID 0/1) arrays.

Installing FastCheck

1. Insert RXDW support CD.
2. Follow the step that showing on the screen to install the utility.
3. During installation, click YES when prompted to run the utility on every startup. If NO is selected, FastCheck will not initialize during startup. You may manually execute the utility via the Start button.

NOTE: We recommends to have FastCheck load during Startup. This insures you that it will be ready to post alerts on errors.

Running FastCheck

As described in the Installation section, the default option for FastCheck is to load during startup of Win9x/ME/NT/2000. It appears minimized on the taskbar under Win 95/98/NT4/2000/ Millennium (see below).

To start FastCheck, double-click on the FastCheck icon on the taskbar (above) or you may also use the Taskbar Start/Promise/FastTrak/FastCheck menus shown below.


Closing FastCheck

Once FastCheck is opened (either automatically on startup or manually), the monitoring utility remains running in the background even if the user "closes" the FastCheck window.

To completely shut down FastCheck, perform the following steps.

1. Right-click the FastCheck icon on the Taskbar.
2. Select Exit from the pop-up window.
3. FastCheck will no longer be running and will no longer be monitoring the array.

Using FastCheck Array Window

Once FastCheck is selected, the FastCheck Monitoring Utility window will appear. The main pane has three information window tabs: Array, Controller, and Options. The user can switch screens by clicking on the tab. The Array Window is the active screen by default as shown below:
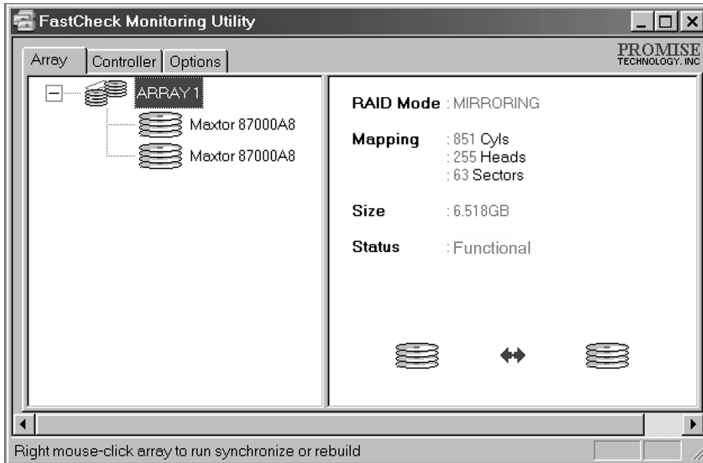
The Array Window (see above) displays information about the arrays configured on your FastTrak100 through the FastBuild BIOS. From this window, you can also perform data Synchronization of mirrored arrays, or Rebuild data from one drive to a replacement drive within a mirrored array.

While the Array Window does not allow you to change the array configurations directly, it clearly identifies which drives are associated with each array shown in the left pane.

Viewing Array Information

By left-clicking on the Array #, the right pane shows the following information categories for that array:

   RAID mode: (Striping, Mirroring, Mirroring & Striping, Spanning)

   Mapping: (similar to physical drive specifications) describing # of cylinders, heads, and sectors of the array's "virtual" drive as seen by the system

   Size: Storage capacity of the array
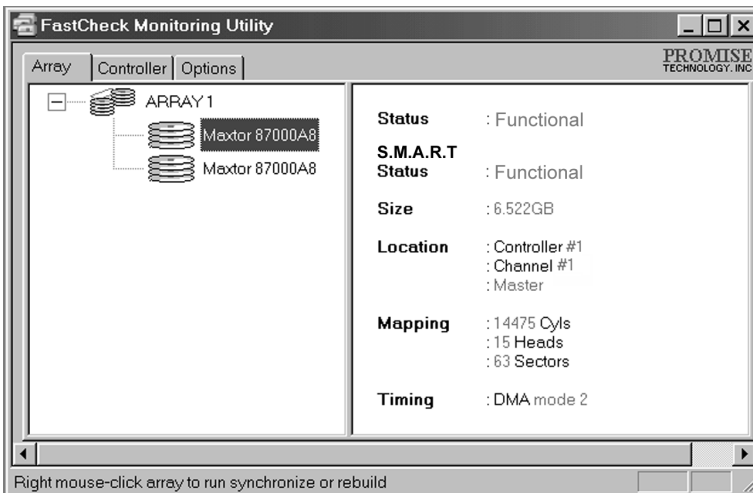
   Status: (Functional, Critical, Offline)
       Functional: Means the array is providing full functionality

---
36

Critical: Used only in reference to a Mirroring array (RAID 1 or RAID 0+1). A problem has been detected in one of the drives of the array and the drive has been taken "offline." However, a "critical" array will continue to save and retrieve data from the remaining working drive(s). Promise recommends replacing the failed drive as soon as possible since a "Critical" array offers no data redundancy.

Offline: This would appear most commonly within a RAID 0 or Spanning array. The "Offline" results from a drive having failed which has taken the entire array "offline." In this case, you have likely lost data. Fix/replace the drive that has failed, then restore data from a backup source.

Viewing Arrayed Drive Information

By left-clicking on a drive member of an array in the left pane, the right pane shows the following information categories for that drive:

Status (also shown under the Array Window) can be Functional, Critical, or Offline. The meanings are shown below.

Functional: Means the drive is working normally

Critical: A problem has been detected in the drive and the drive taken offline as part of a mirroring array. Mirrored arrays will continue to function without the drive. Fix/replace the drive that has failed, then restore data from a backup source.

Offline: Drives that are NOT identified as "bad" may be taken offline if part of a Striping or Spanning array containing a "bad" drive. These drives do NOT need to be replaced, however.

S.M.A.R.T. Status: Indicates whether attached hard drive implements Self-Monitoring Analysis & Reporting Technology to predict drive failure

Size: Indicates capacity of individual drive

Location: Shows physical location of drive. Indicates on which IDE channel (3 or 4), and whether drive is Master or Slave on cable. This allows user to identify drives for removal/replacement.

Mapping: Indicates physical parameters of drive (cylinders, heads, sectors)

Timing: Shows selection of drive timing (directly related to burst speed) based on type of drive and cable used.

Using Array Pull-down Menu

At the bottom of the Array window, it indicates to right-click on an Array to perform synchronization or rebuild operations. Right-clicking displays the following pull-down menu:
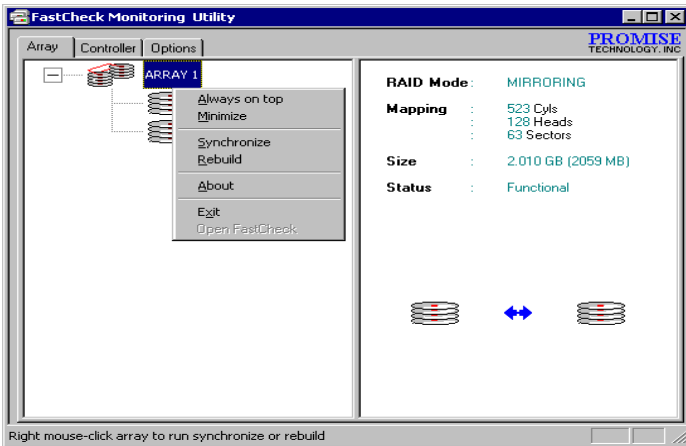

From this menu, users may choose to have the Window Always **Appear** on Top of applications, **Minimize**, **Synchronize** mirrored drives, **Rebuild** a mirrored array, use **About** to check FastCheck version #, or **Exit** the onscreen window.

Synchronizing An Array

Synchronization is a periodic maintenance procedure for Mirroring (RAID 1, RAID 0+1) arrays to maintain data consistency on all mirrored drives. In operation, array synchronization compares data on the mirrored drives for any differences. If there are differences detected, data from the primary drive(s) is automatically copied to the secondary drive(s). This assures that all mirrored drives will contain the exact information.

NOTE: You may instead choose to schedule array synchronization automatically under the Options Tab view versus manually initiating synchronization .

1. To synchronize, choose the Array Tab View (see figure on previous page).
2. Right-click on the array you wish to synchronize and choose "Synchronize" from the context menu.
3. Click "Yes" to initiate Synchronization (see below) when the Confirmation window appears. To cancel this option, click the No button.
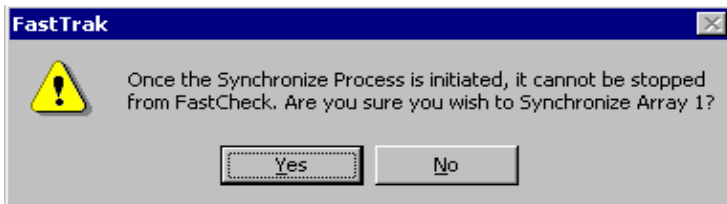
WARNING: Once initiated, synchronization can NOT be halted in order to prevent data errors.

4. Once Synchronization is confirmed, the following information screen appears. Click OK button or close the window to proceed.
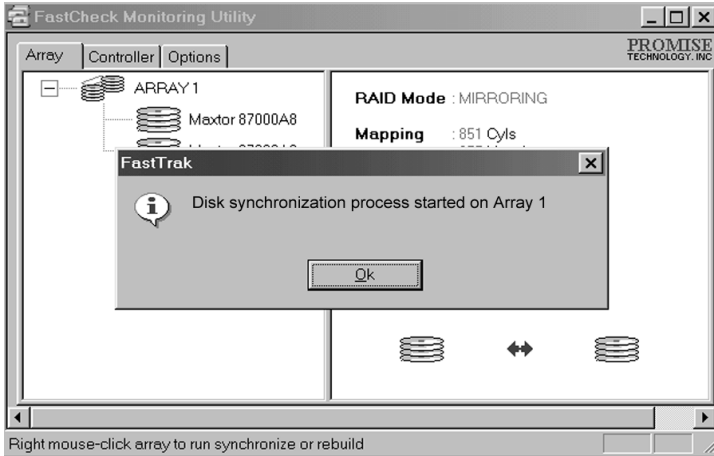
NOTE: During Array Synchronization, users may continue to access the working array and perform normal PC functions. However, system performance will be slightly degraded and the process will take longer.

5. A progress bar will appear at the bottom of the FastCheck Monitoring window showing synchronization in progress and the percentage that has been completed.

Rebuilding An Array

This command effectively copies or overwrites data from an existing data drive in the array on to a blank drive. The operation will be typically used when a failed drive has been replaced with a new drive as part of a mirrored array.

1. To perform a Rebuild, choose the Array Tab View.
2. Right click the array number and choose Rebuild from the context menu.
3. Once Rebuild is selected, you will be asked to "Initialize Rebuild process on Array #" by clicking OK.

Using Rebuild Wizard

1. Initiating rebuild array will open the Rebuild Wizard Step 1 screen shown below.
2. Select the Target drive which will receive data. Make sure you select the blank new or replacement drive. The unselected drive will contain "good" data. It will be the remaining working drive of an array, or a system drive containing existing data that you wish to mirror.
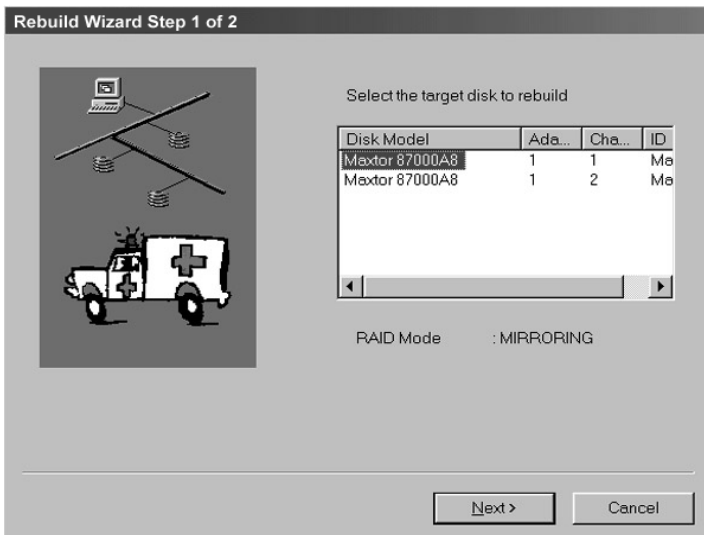

WARNING: Make absolutely sure and double-check which drive is which. If data exists on the target drive, it will be over-written.

3. Click the Next button to proceed to Rebuild Wizard Step 2 (see next page) or Cancel button to stop.

4. Rebuild Wizard Step 2 confirms the Target or "Rebuild" disk by Array # and drive ID.
5. Click Finish button to initiate physical Rebuild, Back button to review Step 2, or Cancel button to Stop. A final confirmation window appears as below:
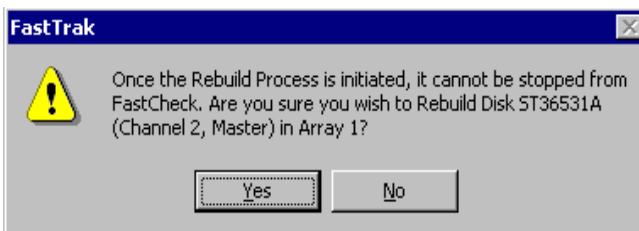
6. Click "Yes" to initiate Rebuild. To cancel this option, click the No button.

WARNING: Once initiated, Array Rebuild can NOT be halted in order to prevent data errors.

NOTE: During Array Rebuild, users may continue to access the array and perform normal PC functions however the array will NOT provide data redundancy until Rebuild is completed. If you choose to continue using the PC during rebuild, system performance will be slightly degraded and the process will take longer.

6.   Once Array Rebuild has begun, users are returned to the FastCheck Monitoring window. A progress bar showing the rebuild progress in percentage will appear at the bottom of the FastCheck Monitoring window.

NOTE: When a "spare" unassigned drive is present on the FastTrak100, a rebuild will automatically be performed from the remaining working drive.

Using Controller Window

Clicking on the Controller tab, will reveal the Controller Window. This displays physical information about the location of FastTrak100, data channels on the controller, and the attached drives.
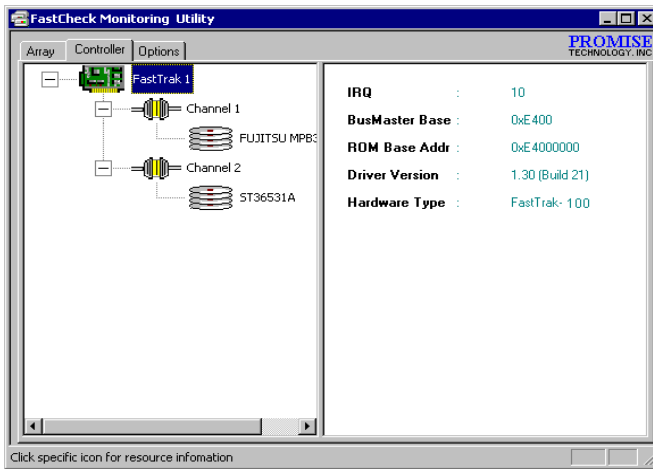
Viewing Controller Information

 By left-clicking on the FastTrak controller icon, the right pane shows the following information categories for that array:

  IRQ: Identifies interrupt request assigned to PCI slot

  Bus Master Base: Shows base address in hex numbering for board's bus master Input/Output function

  ROM Base Address: Shows base address in hex numbering for FastTrak's Flash ROM chip

Driver Version: Identifies which version of the Promise FastTrak100 driver you have installed.

Hardware Type: Identifies which FastTrak product is installed.
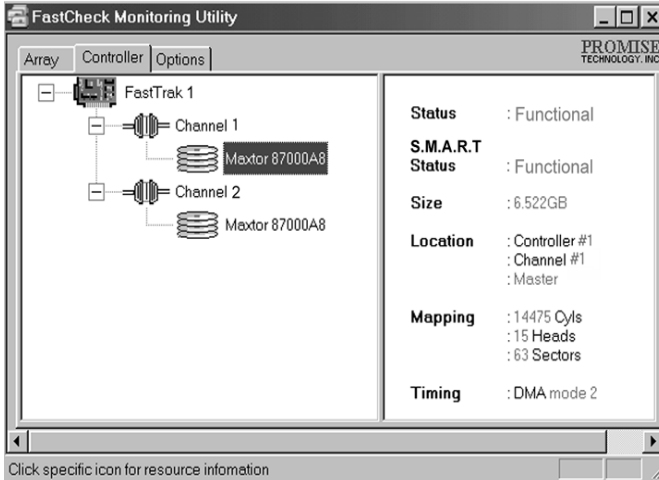
Viewing IDE Channel Information

Left-clicking on a given Channel icon or # in the left pane, will show the Base IO addresses of the channel in the right pane (used for troubleshooting).
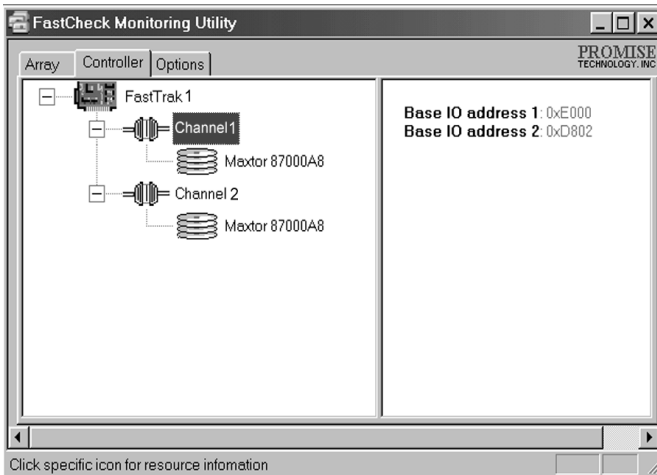
Viewing Drive Information

Left-clicking on a given Drive icon or ID in the left pane, will show similar information categories as the Array Window Drive Information in the right pane.

Status (also shown under the Array Window) can be Functional, Critical, or Offline. The meanings are shown below.

> **Functional:** Means the drive is working normally

> **Critical**: A problem has been detected in the drive and the drive taken offline as part of a mirroring array. Mirrored arrays will continue to function without the drive. Fix/replace the drive that has failed, then restore data from a backup source.

> **Offline**: Drives that are NOT identified as "bad" may be taken offline if part of a Striping or Spanning array containing a "bad" drive. These drives do NOT need to be replaced, however.

S.M.A.R.T. Status: Indicates whether attached hard drive implements Self-Monitoring Analysis & Reporting Technology to predict drive failure

**Size:** Indicates capacity of individual drive

Location: Shows physical location of drive. Indicates on which IDE channel (3 or 4), and whether drive is Master or Slave on cable. This allows user to identify drives for removal/replacement.

Mapping: Indicates physical parameters of drive (cylinders, heads, sectors)

Timing: Shows selection of drive timing (directly related to burst speed) based on type of drive and cable used.

Using Options Window

Clicking on the Options tab reveals the Options Window. Array administrators can customize the FastCheck Monitoring Utility in four major areas: Notification, Array Synchronization Scheduling, setting Password, Desktop Appearance. Most options relate to Mirroring arrays (RAID 1 or RAID 0+1).
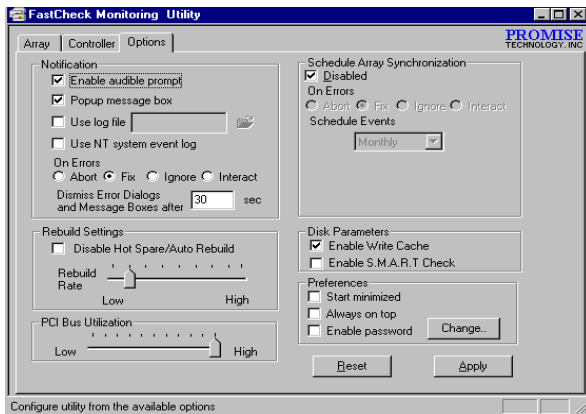
Selecting Notification Options

This section of the Options windows allows users to select how they are notified of a system event. A System Event includes driver-initiated Rebuilds (automatic rebuild using a "hot" spare standby drive), user-initiated manual Rebuilds or manual Synchronization, and Error-Handling reporting for these processes.
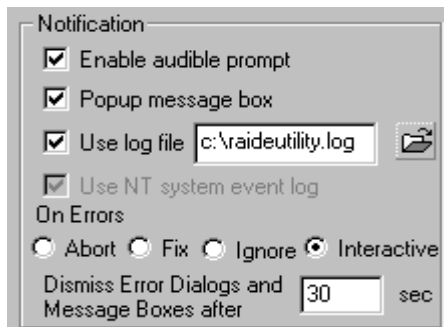
Enable audible prompt checkbox turns on/off an audible alarm of an event (typically a drive failure, or completion of rebuild or synchronization).

Popup message box checkbox turns on/off the appearance of an event message box that would typically indicates a drive failure, or completion of rebuild or synchronization.

Use log file checkbox allows writing operating event logs of the array activity (alerts and status reports) to a given file name and directory. If a file name is used but the path left blank, the default directory is the same as the FastCheck Utility (typically C:\Program Files\Promise\FastTrak100).

Use NT system event log checkbox is greyed out under Windows 9x/ME/2000/Millennium automatically. Under Windows NT4, it permits user to write array logging to NT's own event log.

1. To view FastCheck events under Windows NT, go to Start/Programs/Adminstrative Tools/Event Viewer.

2. In the Event Viewer, choose "Log" from the menu bar, then check "Application." Any events generated by FastCheck will appear under the Source column as "FastCheck."

On Errors section offers four radio button choices for the user to select what procedure they would like to perform if an Error is detected during automatic/manual Rebuilds or manual Synchronization. There are three types of errors that FastTrak100 detects -- a data mismatch between the primary and secondary drive, a physical media error on source or target drive, or a total disk failure. The options for handling Errors are as follows:

Abort: stops any Synchronization or Rebuild process if an error is encountered.

Fix: in most cases, FastTrak100 automatically can correct errors. The method of correction varies depending on the type of error.

Ignore: FastTrak100 will log the event error and continue the rebuild or synchronization process. Use this setting if you want to detect the presence of errors, but do not want to fix these errors at the time. The user may then decide what to do about the error(s) detected.

WARNING: This may result in mismatched drives under RAID 1 or 0+1.

Interactive: By checking this option, a selection window will appear each time an error is detected asking the user whether they want to Abort, Fix, or Ignore the error (see Troubleshooting section).

Dismiss Error Dialogs designates the length of time (in seconds) that a Message box or Error Dialog box appears on screen.

Scheduling Array Synchronization

This section of the Options Window allows a user to schedule when and how often FastTrak100 will perform synchronization maintenance of a mirrored array.
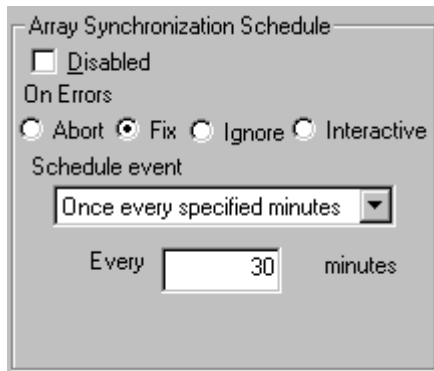
Disable checkbox is checked (the default) to turn off automated scheduling of synchronization. When unchecked, the Scheduling section will be highlighted (see above).

On Errors section offers four radio button choices for the user to select what procedure they would like to perform if an Error is detected during a scheduled Synchronization. There are three types of errors that FastTrak100 detects -- a data mismatch between the primary and secondary drive, a physical media error on source or target drive, or a total disk failure. The options for handling Errors are as follows:

Abort: stops the Synchronization process if an error is encountered.

Fix: in most cases, FastTrak100 automatically can correct errors. The method of correction varies depending on the type of error (see Appendix under Error Correction Methodology).

Ignore: FastTrak100 will log the event error and continue the synchronization process. (Warning: this may result in mismatched drives under RAID 1 or 0+1). Use this setting if you want to detect the presence of errors, but do not want to fix these errors at the time. The user may then decide what to do about the error(s) detected.

Interactive: By checking this option, a selection window will appear each time an error is detected asking the user whether they want to Abort, Fix, or Ignore the error (see Troubleshooting for more details).

Schedule event drop down box allows scheduling synchronization by minute, by hour, by day, by week, or by month. If enabled, the default is By Month. This allows synchronization to take place during an off-hour when the system is either not in use or not at peak demand.

Start time designates hr/min/ am/pm

On the designates day of week or by ordinal (1st, 2nd, 3rd....) selection.

Setting Rebuild Options
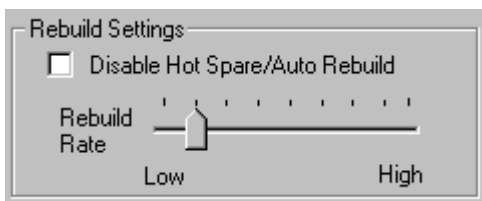
Disable Hot Spare/Auto Rebuild checkbox turns off the use of a "hot" spare drive and automatic rebuilding of a mirrored array. The default is unchecked (or enable Hot Spare/Auto Rebuild).

Rebuild Rate assigns the amount of importance that FastTrak100 gives to mirroring data from one drive to another in the background. A "high" setting assigns most of FastTrak100's resources to the rebuild process at the expense of responding to ongoing read/write data requests by the operating system. A "low" setting gives priority to ongoing read/write data requests by the operating system at the expense of the rebuild process and will typically result in longer rebuild times. The setting shown above is the default.

Setting PCI Bus Utilization Option

NOTE: In most cases, a user does not need to change this setting since FastTrak100's data handling rarely conflicts with another PCI device. However, certain brands of video capture cards can produce a "glitch" on play back of A/V files that may require adjusting the default setting devices (see Tips for Audio/Video Editing for more information).

This section of the Options Window allows a user to change how much time the FastTrak100 holds on to the PCI bus to transfer data.

The default setting of "High" on the slider bar means FastTrak100 holds on to the PCI bus longer for data transfers to occur. A setting of "Less" reduces the time which FastTrak100 occupies on the PCI bus and frees that time for use by other PCI devices.
Once a bus setting has been selected, click the Apply button on the Options window to implement changes immediately.

Setting Disk Param(eters) Option
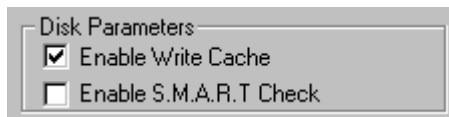
Enable Write Cache checkbox allows user to enable/disable write cache for hard drives that include this performance feature. FastCheck automatically recognizes such drives and enables the feature as the default setting. For drives that do not use write caching, this option is automatically greyed out.

Enable S.M.A.R.T. Check checkbox tells FastCheck to regularly monitor each drive to assure that drive failure prediction is functioning. The default is unchecked, meaning FastCheck will not monitor this function.

Setting Screen Preferences

This section controls how the FastCheck utility screen is displayed and sets the security password to protect the administrative settings.
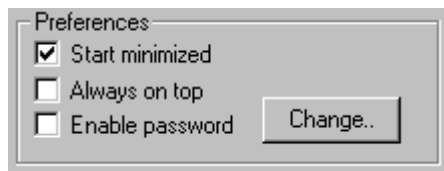
Start Minimized checkbox allows user to have FastCheck appear on the toolbar only on startup. Click on the icon to see the FastCheck utility screen.

Always on Top checkbox tells the Utility to appear above all programs until closed or minimized manually.

Enable Password checkbox in the Preferences section turns on/off use of a Password every time the FastCheck Monitoring Utility icon is selected or the program is run from the Start menu. Disabling use of a current password requires password entry (see Creating Password on next page).

Creating Password

1. To create a password, check the **Enable Password** checkbox in the Preferences section.The "Set Password" window will appear.
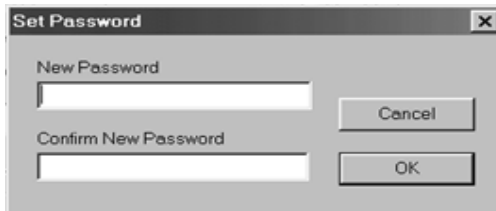
2. Type the password you want to use. Press the Tab key or click to retype the same password in the "Confirm New Password" section. Click the OK button.

NOTE: Remember to record the password you use in a secure place in case you forget it.

3. A confirmation screen will appear saying that "Password Checking is Enabled". Click the OK button.

4. Once the password feature is enabled, the following menu will appear before the FastCheck window can be opened.is enabled, the following menu will appear on each use of FastCheck.

Changing Password

1. Input the original password you first created to gain access to FastCheck.

2. Click on Options tab, then click on the Change button in the Password section. The Set Password screen will appear (see figure in step 3 above).

3. Type the password you want to use. Press the Tab key or click to retype the same password in the "Confirm New Password" section.

4. Click OK button.

Disabling Password

1. Input the original password you first created to gain access to FastCheck.

2. Click on Options tab

3. Uncheck the "Enable Password" checkbox. Click Apply button on Options window

Understanding Disk Array Concepts

About FastTrak100 Disk Array controller

FastTrak100 is a high performance Ultra ATA/EIDE RAID controller that features parallel data channel operation and an onboard BIOS. The two channels on the FastTrak100 support parallel operation that allows for overlapped I/O under multi-tasking operating systems and sharing the workload between multiple drives.

About FastTrak100 controller BIOS

The FastTrak100 controller contains a BIOS code that extends the standard disk service routine provided through Int13. The BIOS is bootable for DOS and other operating systems that rely on the system BIOS for drive operation. FastTrak100 can support drives and disk arrays with capacities exceeding 8.4 GB using Extended Interrupt13 support. When the FastTrak100 BIOS appears during bootup, users can press <F2> to enter the FastBuild^{TM} setup to select from menu settings.

FastBuild^{TM} Auto Menu Setup

This setup utility is used to build and manage FastTrak100 disk arrays. The utility is menu driven and features the <1> Auto Setup option that uses a simple, interactive setup process. Once the array is built, all the array members store the configuration information in the drive's reserved area. See Chapter 4 that provides descriptions of individual functions.

Reserved Sector

Array configuration data about the drive member and other members in the disk array are saved on a special location on the disk drives called the reserved sector. If any member of the array becomes corrupt or lost, the redundant configuration data on the other members can be used for rebuilds.

Disk array members do not have a "memory" of their drive positions. This allows drives to be placed on different FastTrak100 connectors or cards within the system without reconfiguring or rebuilding.

Disk Array Terms

Disk Array Description

A "disk array" is formed from a group of 2 or more disk drives which appear to the system as a single drive. The advantage of an array is to provide better throughput performance and/or data fault tolerance. Better performance is accomplished by sharing the workload in parallel among multiple physical drives. Fault tolerance is achieved through data redundant operation where if one (or more) drive fails or has a sector failure, a mirrored copy of the data can be found on another drive(s).

For optimal results, select <u>identical</u> Ultra ATA/100 drives to install in disk arrays. The drives' **matched performance** allows the array to function better as a single drive.

Disk Array Member

The individual disk drives in an array are called "members." Each member of a specific disk array is coded in their "reserved sector" with configuration information that identifies the drive as a member. All disk members in a formed disk array are recognized as a single physical drive to the system.

Disk Array Types

For most installations, the FastBuild^{TM} setup "<1> Auto Setup" option will configure your system.

There are four disk array types in three categories that can be installed on the FastTrak100 controller. Striping is in the Performance category while Mirroring, Striping/Mirroring are in the Fault Tolerance category. Spanning (JBOD) is in the Capacity category.

Disk arrays within the Performance and Fault Tolerance categories conform with the **R**edundant **A**rray of **I**ndependent **D**isks technology, or RAID. The RAID levels supported are 0, 1, and 0+1.

RAID Level	Performance	Capacity	# of Drives
RAID 0 (Striping)	Highest	# Drives x Smallest Size	2 to 4
RAID 1 (Mirroring)	Normal	50% min	2
RAID 0+1 (Stripe/Mirror)	High	50% min	4
JBOD (Spanning)	Normal	100% of All Drives	2 to 4

About RAID Levels

Striping (RAID 0)

Reads and writes sectors of data interleaved between multiple drives. When any disk member fails, it affects the entire array. Performance is better than a single drive since the workload is balanced between the array members. This array type is for high performance systems. Identical drives are recommended for performance as well as data storage efficiency. The disk array data capacity is equal to the number of drive members times the smallest member capacity. For example, one 1GB and three 1.2GB drives will form a 4GB (4 x 1GB) disk array.
Stripe Size - a value can be set from 1KB to 1024KB sector size. The size can directly affect performance. In the FastBuild BIOS, the "Desktop" default is 8KB while "Server" and "A/V Editing" are 64KB.
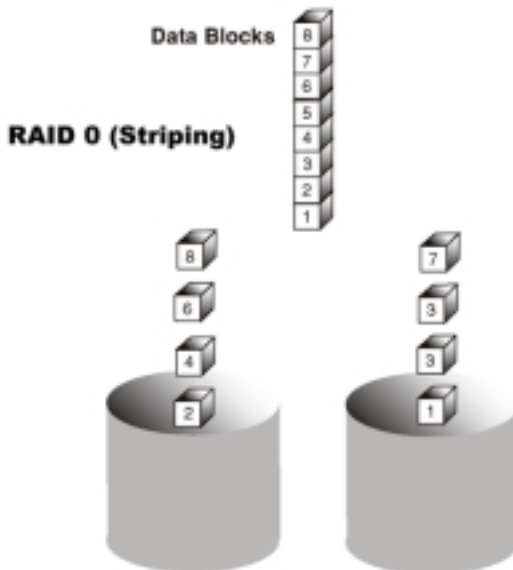
Mirroring (RAID 1)

Writes duplicate data on to a pair of drives while reads are performed in parallel. ATA RAID 1 is fault tolerant because each drive of a mirrored pair is installed on separate IDE channels. If one of the mirrored drives suffers a mechanical failure (e.g. spindle failure) or does not respond, the remaining drive will continue to function. This is called **Fault Tolerance**. If one drive has a physical sector error, the mirrored drive will continue to function.

RAID 1 (Mirroring)
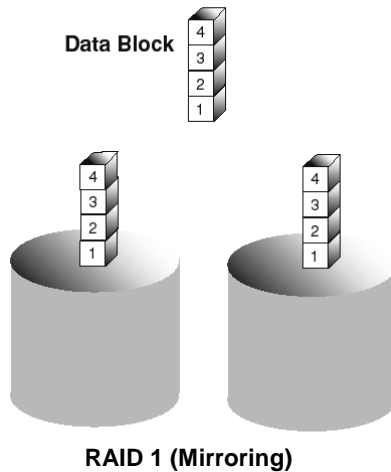
On the next reboot, the FastBuild^{TM} utility will display an error in the array and recommend to replace the failed drive. Users may choose to continue using their PC, however Promise recommends replacing the failed drive as soon as possible. See Chapter 4 for a functional description.

Due to redundancy, the drive capacity of the array is half the total drive capacity. For example, two 1GB drives that have a combined capacity of 2GB would have 1GB of usable storage. With drives of different capacities, there may be unused capacity on the larger drive.

Using a Spare Drive

Under a RAID 1 setup, an extra "hot spare" drive (a third drive on FastTrak100) can be attached to the FastTrak100 and not assigned to the array. Such a drive will be activated to replace a failed drive that is part of a mirrored array. A rebuild is performed automatically in the background to mirror the good drive data on to the spare.

At a later time, the system can be powered off and the failed drive can be physically removed and replaced. Spare drives must be the same or larger capacity than the smallest array member.

Striping/Mirror (RAID 0+1)

A combination of both above array types. It can increase performance by reading and writing data in parallel while protecting data with duplication. A minimum of four drives needs to be installed. With a four-drive disk array, two pairs of drives are striped. Each pair mirrors the data on the other pair of striped drives. The data capacity is similar to a standard Mirroring array with half of total capacity dedicated for redundancy.
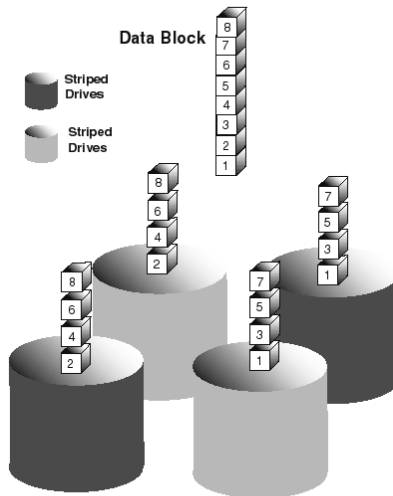
About Dual Data Redundancy

One unique (though rarely occurring) feature of RAID 0+1 is dual fault tolerance. In some cases, tow drives can fail simultaneously and still maintain the integrity of data. There are six combinations in which two drives can fail. FastTrak100 protects the data array in four of those cases depending on drive type (some drives do not permit the Slave drive to continue to function if the Master drive fails).

Assume the drives are configured as follows (M= Master, A/B indicates which striped pair the drive belongs to, # indicates which part of stripe data):

	IDE 1	IDE 2
M	Drive A1	Drive B1
S	Drive B2	Drive A2

Under RAID 0+1, the array maintains data integrity if any 1, 2 combination survives.

Event	Failed Drives	Array Status	Why?
1	A1/A2	Working	B1/B2 retain array integrity
2	B2/B1	Working	A1/A2 retain array integrity
3	A1/B2	Working	B1/A2 retain array integrity
4	B1/A2	Working	A1/B2 retain array integrity
5	A1/B1	Offline	B2/A2 contain only half of array data
6	B2/A2	Offline	A1/B1 contain only half of array data

Spanning (JBOD)
A Spanning disk array (also aptly named as JBOD for "Just a Bunch of Drives") is equal to the sum of all drives when the drives used are of different capacities.
Spanning stores data on to a drive until it is full, then proceeds to store files onto the next drive in the array. There are no additional performance or fault tolerance array features in this array. When any disk member fails, the failure affects the entire array.
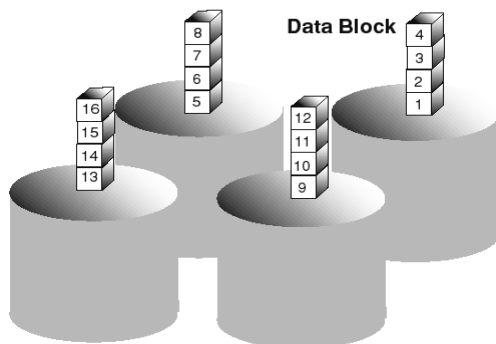
Troubleshooting & Tips

This section is used to assist with troubleshooting conflicts and FastTrak100 installation problems. It is divided into the following categories: Motherboard Issues, System CMOS Issues, Drive Errors, Operating System Errors, and Audio/Video Editing Tips.

Motherboard Issues

Freeing additional IRQ resources

Since the Promise FastTrak100 controller supports PCI Interrupt sharing, it is possible to use IRQs already assigned to another PCI card. Interrupt Sharing is not supported with onboard IDE controllers. If the onboard IDE controller(s) are not used, you may disable the controllers to free IRQ 14 and/or 15.

Configuring PCI IRQ resources

Setting the IRQ for a particular PCI slot will be different depending on the motherboard BIOS. This setting is usually made in the PCI Configuration and/or Plug and Play (PnP) section of the motherboard BIOS setup. There are three common methods that motherboard BIOS's handle assignment of IRQs to PCI slots:

1. Specifically assigning an IRQ to a particular slot - You can tell the motherboard to use IRQ 10 for PCI slot 1, IRQ 11 for PCI slot 2, etc.
2. Listing which IRQs are available to be assigned to the PCI slots - This BIOS has an option where you specify "1st Available IRQ", "2nd Available IRQ", etc. The BIOS then scans the PCI slots for PCI cards and assigns these IRQs in the order that it finds the PCI cards.
3. Excluding an IRQ from being used by a PCI slot - If you have an ISA card that is using an IRQ, change the setting for this particular IRQ from "Available" to "used by ISA card" so that the motherboard will not assign this IRQ to a PCI slot.

Consult your motherboard manual for information that is specific to your motherboard.

System locks up during bootup or when Windows starts

There may be a possible IRQ conflict with an ISA card. Identify what IRQs are used by ISA cards, enter the Mainboard PCI Setup, and reserve the IRQ for use with ISA. PCI slots cannot share IRQs with ISA cards.

Intermittent data problems

Do not exceed the 33Mhz PCI Bus speed. Pentiums set to higher than default settings or AMD K6 and Cyrix CPUs can exceed these limitations and cause intermittent boot and data problems.

System CMOS Issues

Set Mainboard CMOS Boot sequence to boot to FastTrak100

On some Mainboard BIOS, it is necessary to set the Boot sequence to "RAID/ATA100".

Mainboard CMOS displays C: or D: drive failure during startup

See Drive-Related Errors section.

Using an Onboard IDE Controller with FastTrak100

If an onboard IDE controller is installed with hard disks, enable support in the Mainboard Standard CMOS Setup for the drives. Note that the onboard IDE hard drives will then be the bootable hard disk unless the system BIOS has a boot sequence setting with a "RAID/ATA100" option.

Drive-Related Errors

Critical Array Status Error Reported during Boot

If a critical status error message appears on the FastTrak100 BIOS startup screen for a mirrored array (see below), there is a drive in the array which has failed or is not responding. FastTrak100 will identify the failed drive by channel number and Master/Slave designation (if 2 drives exist on the same cable). The mirrored array has lost its fault tolerance, but will still perform normal drive reads and writes.

> Operation aborted because FastBuild encountered an error as follows:
>
>   Location: Channel 2 - Master Drive
>   Array Status: Critical
>
> Please retry using FastCheck utility to recover all data. Reboot the system by pressing the ENTER key.

Try powering the system off and on to reset the drive. Also confirm that cables are properly attached and the drive is receiving power. If the drive still appears to have failed, proceed to "Rebuild Array" option of FastCheck detailed on page 41.

Drive cannot be formed into an array

Drives must support Ultra DMA or Multi-word DMA and be free of media defects to be added into an array. Promise recommends using new identical drives for each array. Re-secure data and power cabling while checking for proper alignment. Typically, Pin 1 of the drive is closest to the power connector.

Possible Master/Slave problems

Master/slave problems may exist between two ATA or IDE drives of different brands attached to a single cable. For both compatibility and better performance, choose drives of the same model/brand and install them on separate cables. Refer to the Drive Setup by Connector chart for more recommended drive placements.

System CMOS displays C: or D: drive failure during Startup

Do not reference C: or D: in the Mainboard Standard CMOS for drives attached to the FastTrak100 controller. Only enter drive information in the Mainboard CMOS for drives attached to a conventional add-on or onboard IDE controller.

FDISK reports a much lower drive capacity if a single physical drive or a striped array exceeds 64GB

Due to a limitation with FDISK, the utility reports only the storage capacity that exceeds 64GB. This is a cosmetic, not actual, limitation. Simply create a single DOS drive partition, reboot, then format the partition. The Format command will recognize the total capacity of the partition accurately. Windows NT/2000/98 will now recognize the total capacity of your array.

Unable to partition or format array

The Reserve Sector of one of the drives has become corrupt or bad. Removing the Reserve Sector will remedy any issue related directly to a Bad Reserve Sector.

WARNING: Before removing the Reserve Sector of the drive(s), backup any existing data. Removal of the reserve sector of any drive permanently deletes all existing data on the hard drive. For Mirrored arrays (RAID 1), you should remove the Reserve Sector from the "mirrored" drive first (this will appear during Step 3 below) then rebuild the mirrored array. Remove the Sector on the Master Drive only as a last resort. For Striped arrays (RAID 0), removing the Reserve Sector from any of the drives that are striped will destroy the arrayed data.

To remove the Reserve Sector, follow these steps:
1. When the FastTrak100 BIOS comes up, press Crtl-F to enter the FastBuild.
2. Press 2 to "View Drive Assignments".
3. Using the arrow keys, highlight the drive where you wish to remove the reserve sector.
4. Press ALT-F1. The highlighted drive will start blinking on the screen.
5. Press CTRL-TAB. A message will appear that says the reserved sector (which is where array information is kept) on the disk will be wiped.
6. Press "Y" to confirm.
7. For a mirrored arrays, hit the "ESC" key twice to reboot and skip to step 10.
8. For striped arrays, repeat this process for each member of the particular array that is having a problem.
9. When finished, hit the "ESC" key twice to reboot.

10. After rebooting, use FastBuild to re-create the array. For mirrored arrays, rebuild the mirrored array. For striped arrays, use FDISK and FORMAT after setting up the array.

Array Constantly Goes Into Critical or Offline Mode During Reboot
(see "Unable to Partition or Format array" above)

Cannot Rebuild Mirrored (RAID 1) Array
(see "Unable to Partition or Format array" above)

Fatal Errors or Data Corruption Are Constantly Reported When Reading or Writing to Drive Array
(see "Unable to Partition or Format array" above)

ECC Error Reported on Rebuild

The following screen will appear if a data error is detected on either source or target drive during Rebuild if you have set the On Errors setting to "Interactive" within FastCheck's Options Window (see page 46).

Your choices are as follows:

> **Abort:** Halts the rebuild process. You may elect to retry at a later date.

> **Break ECC on Target Drive**: If the error is detected on the source drive, "Break ECC on Target Drive" means that FastTrak will copy the bad data sector on to the target drive to assure that both drives are identical. If the error is detected on the target drive, FastCheck will copy the data contained in the good sector of the source drive again to the target drive.

Skip the Error Block: FastTrak100 will log the event error and continue the rebuild process. Use this setting if you want to detect the presence of errors, but do not want to fix these errors at the time. You may then decide what to do about the error(s) detected.

ECC Error Reported on Synchronize

The following screen will appear if a data error is detected on either source or target drive during Synchronize if you have set the On Errors setting to "Interactive" within FastCheck's Options Window for Scheduled Synchronization (see page 48) or for Manual Synchronization under Notification options (see page 46).
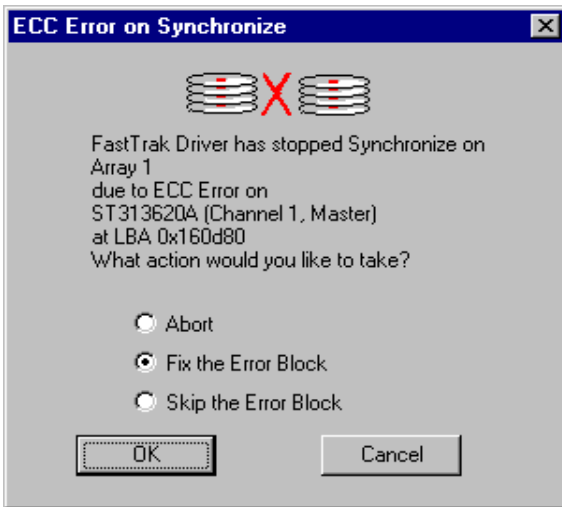
Your choices are as follows:

Abort: Halts the synchronization process. You may elect to retry at a later date.

Fix the Error Block: FastTrak100 will take a good data block from either drive and copy it to the drive where the error was detected.

Skip the Error Block: FastTrak100 will log the event error and continue the synchronization process. Use this setting if you want to detect the presence of errors, but do not want to fix these errors at the time. You may then decide what to do about the error(s) detected.

Operating System-Related Errors

Different drive lettering under Windows NT

This may happen when using a SCSI card in addition to the Promise RAID controller. Windows NT does not necessarily load the driver for the boot device controller first. This results in a drive that in MS-DOS is the C: drive being the D:, or E:, etc. in Windows NT. Use Windows NT's Disk Administrator utility to reassign the letters which NT has assigned to the drives. See your Windows NT documentation for instructions on how to use Disk Administrator.

The Operating System no longer boots after creating a Mirrored Array using your existing boot drive using Windows 98/NT4/2000

This is due to Drive Geometry issues. You can verify this if you move the original drive back to the onboard controller and it boots. Each controller can view a drive differently. This can be an issue for a new controller which loads the original Master Boot Record (MBR) and then has a problem translating it or the Operating System boot record.

For Windows NT or Windows 2000, Promise recommends a "clean" install of the Operating System. This restores the MBR and OS boot record. You will then need to repartition and format the drive.

For Windows 98,you can perform the DOS Command "SYS C:"from a bootable floppy or CD-ROM to restore the operating system boot record and transfer the system files to the boot drive. If this does not work, the Windows 98 registry may have become corrupted during the boot process and must be restored. See the Windows documentation to perfrom this procedure.

Promise Windows driver does not appear Device Manager

Windows may already be listing the controller under "Other Devices" instead of "Hard disk controllers" section. In Device Manager under "Other Devices" to see if it lists a "PCI Card", or "RAID Controller". If so, highlight this listing and click on the "Properties" button, and then click on the "Driver" tab. Depending on your version of Windows, choose either "Change Driver" or "Update Driver". Then follow the on-screen prompts to complete installation of the driver. If Windows asks if you want to test if the device can be removed safely click on "CANCEL. Reboot the system to complete installation of the driver.

"Inaccessible Boot Device" Message Appears During Floppyless Install of Windows NT or 2000

The "F6" key was not pressed at the appropriate time. Reboot the system, and press the "F6" key when the message "Setup is inspecting your computer's hardware configuration…" appears in Windows NT4 or the message "Press F6 if you need to install third party SCSI or RAID driver" appears in Windows 2000.

"No Hard Drives Found" Message Appears During CD-ROM Install of Windows NT or 2000

The "F6" key was not pressed at the appropriate time. Reboot the system, and press the "F6" key when the message "Setup is inspecting your computer's hardware configuration…" appears in Windows NT4 or the message "Press F6 if you need to install third party SCSI or RAID driver" appears in Windows 2000.

Performance Tips
Here are some tips that may optimize performance in a RAID 0 striped array. If you are using an audio/video editing card, we also recommend to review your card's documentation for additional information.

Use FastTrak100 as D: or other non-bootable drive in a Striped Array

For A/V editing, keep the original system boot drive on the standard IDE controller as C: drive. Partitioning software such as FDISK will see the array as one physical drive, D: drive (or later). This will prevent file fragmentation and provide better accessibility to the array.

Re-Configure PCI Latency Setting

The PCI Latency setting appears in <u>some</u> Mainboard BIOS. The setting governs how much time is allocated to service each PCI slot. Promise recommends a valueof 64. An optimal value is neither too high nor too low and will vary from system to system.

Optimize Array for "Performance"

The Promise FastBuild BIOS Utility autosetup menu allows optimizing the array for A/V Editing . The default Performance setting (Striping) selects a Stripe Block size of 64. This larger block size is recommended for the data streaming requirements of A/V editing. You may select an even larger block size in manual mode (see page 15).

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


                       [ Auto Setup Options Menu ]


    Optimize Array for:              Performance
    Typical Application usage:    A/V  Editing


                     [ Auto Setup Configuration ]


    Mode ....................................................... Stripe
    Stripe Block Size........................................... 64
    Drive used in Array......................................... 2
    Array Disk Capacity ................................ 13044


                          [ Keys Available ]

   [↑] Up [↓] Down   [←, →, Space] Change Option   [ESC] Exit   [Ctrl-Y] Save
```

Change Setting of PCI Bus Utilization

Certain brands of video capture cards can produce a "glitch" on play back of .AVI files. A setting of "Less" for PCI Bus utilization reduces the time which FastTrak100 occupies on the PCI bus and frees that time for use by other PCI devices and will remove the "glitch" dropout effect on playback.

Once a bus setting has been selected, click the Apply button to implement changes immediately. No reboot is required.

Frequently Asked Questions

This section lists frequently asked questions involving pre-installation, drive issues, installation, and post-installation.

Pre-Installation

(Speed, Device Types, Capacity, Cabling)

Q: What kind of hard drives can I use for a FastTrak100 array?

A: You <u>can</u> use any IDE/EIDE hard drive(s) to create arrays on the FastTrak100. You <u>should</u> use matching drives for multiple-drive arrays to maximize capacity usage as well as performance. Ultra ATA/100 drives are recommended for highest performance.

Q: Will APM (Advanced Power Management) work with HDDs on the FastTrak100?

A: APM will not work with HDDs on the FastTrak100. This is because the system sees the controller as a SCSI card.

Q: Can I use ATAPI devices on the FastTrak100 controller?

A: No. There is no driver layer on the FastTrak100 controller which will support ATAPI packet messages.

Q: Will the FastTrak100 work with a 37Mhz or 41Mhz PCI bus speed?

A: The current PCI 2.1 specification is for a 33Mhz PCI bus speed. The FastTrak100 is designed around the specification. In most cases, a higher PCI bus speed will result in a variety of different errors. While some people have been able to get these higher speeds to work, since it is out of specification we cannot support it.

Q: How can I change the resources that the FastTrak uses?

A: The FastTrak100 is fully PnP. This means all the resources that it uses are given to it by the PnP BIOS on the motherboard. The FastTrak100 does support IRQ sharing, but this will not work unless ALL the concerned devices support the feature. If your motherboard allows you to control the assignment of these resources, you may be able to remedy the problem by "playing around" with them. You can also try resetting the configuration data in your CMOS. This is usually an option in the PnP section of your CMOS. Otherwise, the only way you might be able to affect these assignments is to switch the PCI slot that the card is in.

Q: **How does the FastTrak100 RAID controller provide storage and/or data protection with their arrays?**

A: FastTrak100 implements three different types of RAID levels as follows:

RAID 0 (stripe)

For capacity -- The FastTrak100 array will be as big as the smallest HDD in the array times however many HDDs are in the array. Any larger HDDs will simply be truncated. The truncated space on the bigger HDDs will then be unusable.

For sustained data transfers -- Using FastTrak100, a RAID 0 array consisting of two HDDs will transfer at about twice the speed of the slowest HDD in the array. A RAID 0 array consisting of four HDDs will transfer at about three times the speed of the slowest HDD in the array.

RAID 1 (mirror)

For capacity -- The FastTrak100 array will be as big as the smallest HDD in the array. The larger HDD will simply be truncated. The truncated space on the bigger HDD will then be unusable.

For sustained data transfers -- The FastTrak100 array will write data at the rate of the slowest HDD in the array. The FastTrak100 array will read data at twice the rate of the slowest HDD in the array.

JBOD (spanning)

For capacity -- The FastTrak100 array will combine the sizes of the HDDs in the array. As soon as one HDD is filled to capacity, the next HDD will automatically be used.

For sustained data transfers -- There is no performance increase with spanning (reading or writing).

Drive Issues

Q: **Can I add a drive to a FastTrak100 RAID array via hot-swap and dynamically adjust the array size/configuration?**

A: No. The FastTrak100 system does not support dynamically adjustable RAID size/configurations.

Q: **Do the HDDs on the FastTrak100 have to be the same size?**

A: The HDDs that you use with the FastTrak100 do not have to be the same size. If the sizes differ, the FastTrak100 will "adjust" the HDDs so that they are compatible. Basically, it will truncate the bigger HDD so the sizes match. Any unused space that results from this is unusable, so don't use HDDs that differ too much. It'll work, but it's a waste.

Q: **Can I take a set of drives which make up an array created on one FastTrak100 server and move it to another FastTrak100 server?**

A: Yes. All FastTrak100 controllers read the arrays the same way. Once the drives are all connected, you must restart the system for it to recognize the newly-inserted array configuration.

Q: **Can I take a drive used in a FastTrak100 array and access it directly with a different controller, such as the one integrated on the motherboard?**

A: Yes, but only under certain configurations. The following array configurations will allow the drive(s) to be accessed individually on another controller: mirror (RAID 0), single drive striped (RAID 1), or single drive spanned (JBOD). Multiple drives striped or spanned will not work. Also, the controller must address the drives as LBA, not CHS.

Q: **If I have a problem with one of the drives on the FastTrak100, how can I low level format it to correct the problem?**

A: Do NOT do this. Low-level formatting IDE drives is unnecessary and generally does not correct problems which might be experienced during use. Errors such as bad sectors or ECC/CRC failure are best remedied by completely replacing the drive. For this reason, drives attached to the FastTrak100 controller should NOT be low level formatted.

Q: **Do I have to install disk management software on my array in order to access the full storage capacity of drives?**

A: No! Disk management software would only complicate things. The array should be fully addressable by your O/S as it is. Remember that some operating systems have varying limits on the sizes of partitions and logical drives that can be defined. Consult your O/S documentation about partitioning larger drives.

Q: **What system BIOS CMOS settings do I use for the drives on the FastTrak100 controller?**

A: None. The drives on the FastTrak100 controller are supported by the FastTrak100 BIOS and/or an O/S drivers, not by your system BIOS.

Q: **How do I partition/format my FastTrak100 RAID array?**

A: The FastTrak100 "fools" the system into thinking that it's dealing with a single HDD. Therefore, anything that you can do to a single HDD can also be done to a FastTrak100 array. You can, and should, use the FDISK and FORMAT utilities to partition/format the array. You can partition the array however you see fit. You can format the array with whatever file system you wish.

Installation Issues

(Capacity, Booting)

Q: **Why are some drives recognized by the FastTrak100 Array Setup utilities with only partial capacity?**

A: Some hard drive models are shipped with a jumper that reduces the addressable capacity of the drive to prevent problems with older systems which won't support larger drives. Consult the documentation accompanying the hard drive to set the jumper appropriately in order to utilize the full capacity of the drive.

Q: **How can I change the system boot sequence in order to boot from the FastTrak100 array?**

A: The boot sequence is controlled by the system BIOS. As far as the system BIOS is concerned, the FastTrak100 controller and defined arrays are categorized as a "SCSI" device (even though the BIOS will not attempt to access the FastTrak100 as any type of SCSI device). This allows you to set the boot sequence in your BIOS CMOS setup utility to boot from "SCSI" (an add-in controller like the FastTrak100) first, rather than "IDE" (an IDE controller built onto the motherboard or one which effectively replaces it). If there are multiple SCSI add-in controllers in the system, then the boot sequence among them will be determined exclusively by their PCI slot priority. PCI slot #1 will be first, slot #2 second, etc. Put the FastTrak100 controller in the PCI slot where it will be accessed ahead of other SCSI controllers if you want to boot from the array.

Q: **How can I change the boot sequence between a PCI SCSI card and the FastTrak100 RAID array?**

A: Since all PCI devices are all PnP, it is difficult to determine which device is addressed first. Some newer motherboard BIOSes may use advanced options that identify devices and allow you to select which device will be assigned resources first. Otherwise you may have to physically switch the device cards on the PCI slots so that the boot device is in the highest priority slot number (see previous question). If you do not require the FastTrak100 BIOS to boot from an array and it is only to be used through a driver under the O/S, one simpler solution would be to disable the FastTrak100 BIOS so that it does not affect the boot sequence at all.

Post-Installation

(Memory Managers, FDISK)

Q: Why does my system reboot after the QEMM driver loads from CONFIG.SYS?

A: The problem lies in the QEMM "Stealth" feature. This feature places the drive information from the DOS System area into the upper reaches of RAM where Windows resides. This causes the FastTrak100 to lose track of its drives when asked to execute the next line in the CONFIG.SYS file. This forces the reboot that you see. Disable QEMM's stealth feature to correct this problem.

Q: Why can't I see the drives on the FastTrak100 under FDISK?

A: The FastTrak100 controller is dedicated to RAID array management and does not provide any means of addressing individual hard drives through the Int 13h interface used by FDISK. In order to access drives on the FastTrak100 from MSDOS at all, you must first create a RAID array.