PM-8600

PENTIUM® 75MHz to 233MHz
PCI, IDE & Multi I/O
VXTWO™ System Board

User's Guide
Revision 1.1

A® symbol of value!™

PM-8600

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HARDWARE DEFINITIONS

MMX™ - A set of 57 multimedia instructions built into the microprocessor that speeds up multimedia operations by substituting a single instruction for repetitive operations that use to take multiple instructions. Only software that has been written especially for MMX™ in mind can take advantage of these multimedia instructions.

Pipeline Burst Cache - External synchronous SRAM cache which transfers "bursts" of data so that today's faster bus cycles and CPU's are not bottlenecked by the MHz speed gap between the CPU and the memory.

EDO DRAM - Extended Data Output Memory. It is faster than regular Fast Page Mode DRAM because it is able shorten certain memory access signals so that more data can be accessed in a given amount of time.

SDRAM - Synchronous Dynamic Random Access Memory owes its increase in performance to it being able to transmit data on every clock cycle as it is able to work at clock speeds of up to 100 MHz..

LEGEND:

This icon signifies helpful hints, important terms, and things to consider.

This icon indicates important information that you MUST heed to prevent possible damage.

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- **CPUs SUPPORTED***

  Intel® Pentium® P54C (75MHz to 200MHz)
  Intel® Pentium® MMX™ P55C (166MHz to 233MHz)
  Cyrix®/IBM® M2 (PR166+ to PR200+)**
  Cyrix®/IBM® 6x86L (PR166+ to PR200+)**
  Cyrix®/IBM® 6x86MX (PR166 to PR233)
  AMD™ K6 (PR2-166 to PR2-233)
  AMD™ K5 (PR75 to PR166)
  High Performance VXTWO™ Chipset
  Supports 3.5, 3.3, 3.2, 2.9, 2.8 & 2.5 volt CPUs with built-in voltage regulator

- **MEMORY**

  Up to 512MB main memory with 4 (2 banks) auto banking 72-pin SIMM slots for Fast Page Mode
  or EDO DRAM, and 2 168-pin DIMM sockets for Fast Page Mode DRAM, EDO DRAM, or SDRAM
  module.

- **CACHE**

  On-Board 512KB Pipeline Burst Cache

- **ENHANCED IDE CONTROLLER**

  Two PCI EIDE Interfaces for up to four EIDE devices in two channels. Individually supports PIO
  Mode 0 to 4 for all four devices - all four devices may have different PIO modes, performance will
  be optimized for each device

- **BUS ARCHITECTURE**

  Four 32-bit PCI Local Bus Slots with Master Mode
  Four 16-bit ISA Bus Slots

- **ON-BOARD I/O CONTROLLER**

  On-Board Interfaces for High Speed Multi-I/Os
  Two 16550 Fast Serial Ports
  One SPP, EPP & ECP Mode Capable Parallel Port
  One Floppy Drive Connector
  One PS/2-type Mouse Header.

- **POWER MANAGEMENT FEATURES**

  SMM/SMI Power Management with APM Software Interface - monitor CPU and I/O status with fully
  user configurable parameters in BIOS

- **BIOS FEATURES**

  Award "Plug and Play" Flash ROM for easy BIOS upgrades
  Built-in NCR810 SCSI BIOS Firmware

* PROCESSORS TESTED AT MANUAL'S RELEASE

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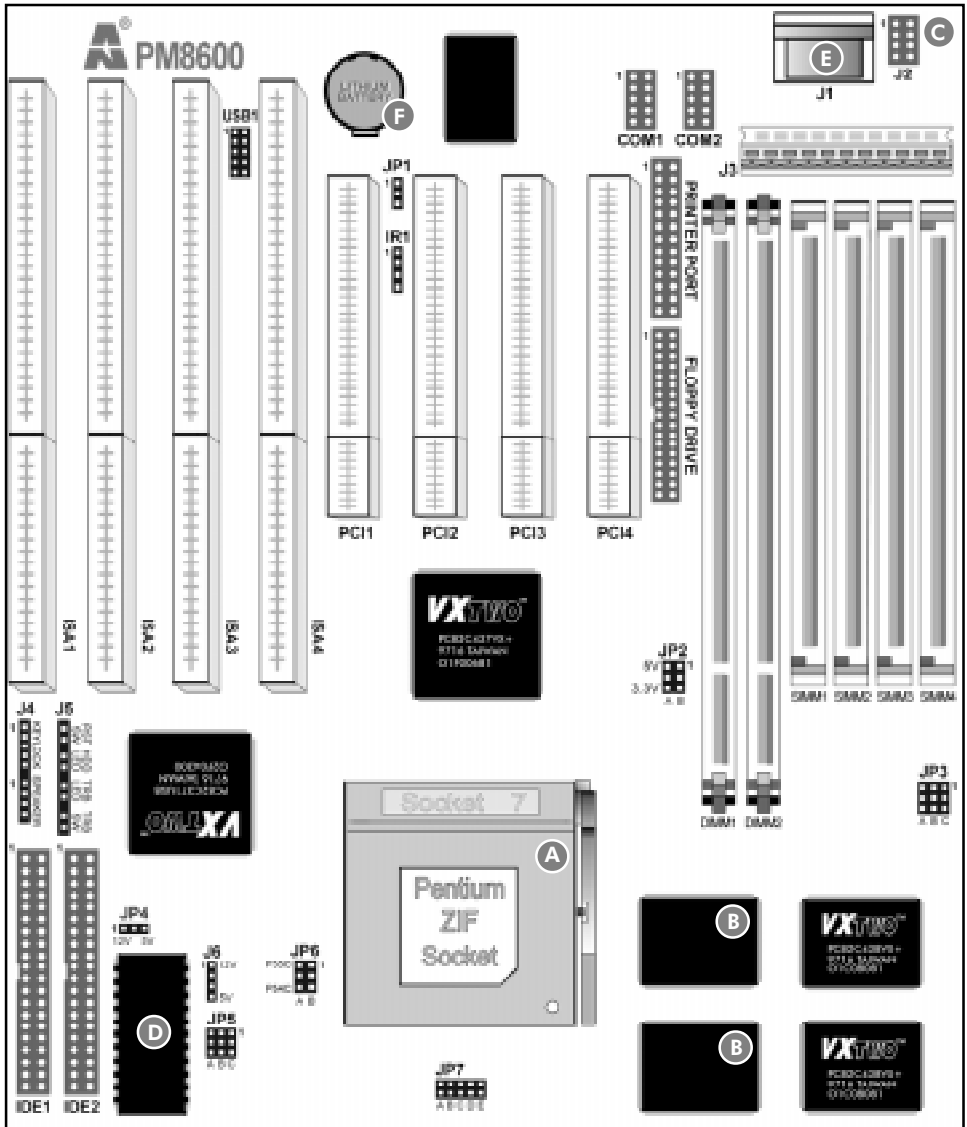
A - ZIF SOCKET - Zero Insertion Force sockets allow for easy installation and removal of CPUs.

B - PIPELINE CACHE - The PM8600 board has a 512KB pipeline burst cache built-in.

C - PS/2 MOUSE HEADER - An optional cable is required for PS/2 mouse usage.

D - BIOS - Stands for *basic input/output system*. The BIOS is built-in software which contains all the instructions required to control the computer's peripherals, CPU, memory, I/O ports and their devices.

E - KEYBOARD CONNECTOR - Plug a standard AT style keyboard into this connector

F - CMOS BATTERY - This powers the BIOS chip

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- **BE SURE YOU KNOW WHAT YOU ARE DOING!** It's easy to get overly excited about your purchase, and to jump right into installing the system board into your case. Too many times, people fail to read the manual or insist on installing it themselves, only to find out later that they've permanently damaged their motherboard and as well as their components. Though this manual will make installation seem like a fairly simple procedure, it is not. So, if you're not a technophile or have little or no computer knowledge, consider asking your vendor or a trained technician to install this board.

- **SET JP3, JP5, JP6 & JP7 TO CONFIGURE YOUR BOARD FOR YOUR CPU** It's fairly easy to forget a jumper or two, so before you power on your system, make sure to check & double check your settings so that you don't prematurely burn out your CPU.

- **INSERT THE CPU INTO THE ZIF SOCKET** Just align the dotted corner of your CPU with the corner of the ZIF socket that looks like its missing a pinhole and pull down gently on the handle.

- **INSTALL YOUR MEMORY INTO THE CORRESPONDING SIMM AND DIMM SOCKETS** Follow the instructions outlined in the memory section of this manual.

- **INSTALL THE MOTHERBOARD ONTO THE SYSTEM CHASSIS MAKING SURE THAT IT IS PROPERLY GROUNDED AND MOUNTED** Take time to do this properly as it makes the installation of your cards and cables easier.

- **CONNECT YOUR HARD DRIVE(S), FLOPPY DRIVE(S), KEYBOARD, PERIPHERAL CARDS, AND I/O CABLES TO THE BOARD** Be sure your cables and cards are properly oriented and plugged in firmly. See the page fifteen for some tips on connecting your cables.

- **CONNECT YOUR CASE LED & SWITCH CABLES TO THE BOARD**

- **CONNECT THE POWER SUPPLY CABLES TO THE BOARD AND TURN ON THE MACHINE** See the sidebar for more information on it's proper installation.

- **GO INTO BIOS AND SETUP YOUR PERIPHERALS AND SYSTEM CONFIGURATION** Press <del> during memory check phase of POST and see the BIOS setup pages of this manual for more details

- **CLOSE YOUR CASE ONCE YOUR COMPUTER AND YOUR OS IS WORKING FINE** Bootup your OS and see if the board and all your peripherals are recognized and working.

"SHORTING" THE JUMPER?

This manual includes jumper settings for many of the features of this board. To properly configure your system board, you will need to know what it means to leave the jumper open, or shorted or when it gives you some numbers. Here's what they mean:

OPEN   SHORT   2 - 3
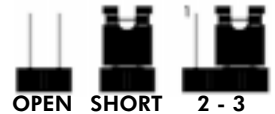
INSTALLING POWER CABLES

Make sure when you've connected the power supply cables to the motherboard that the cables are "pinned" correct. An easy way to make sure that they are plugged in correctly, is that THE BLACK WIRES OF THOSE CABLES ARE ALL SIDE BY SIDE.

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[case LED & switches/flash ROM jumpers]
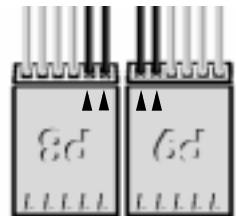
CLEARING CMOS

If you should need to clear you BIOS and/or need to reset your password, you can clear CMOS by momentarily cut the power from the BIOS by shorting JP1 at pins 2-3 for a minute or so. Remember to short pins 1-2 once you're ready to restart your computer.

"FLASHING" YOUR BIOS

We recommend that you DON'T FLASH YOUR BIOS UNLESS TOLD SO BY A SERVICE TECHNICIAN. Unless you encounter an incompatibility while installing a new component, there is no reason why you would need a new BIOS. Otherwise, you can obtain the flash bios program from your vendor, and follow the instructions provided. Also when flashing your bios, note that JP4 has NOTHING to do with this procedure so leave the jumper in its default setting.

J4 Keylock & Power LED

PIN	DESCRIPTION
1	LED Output
2	N.C.
3	Ground
4	Keylock
5	Ground

J4 Speaker Connector

PIN	DESCRIPTION
1	DATA Out
2	N.C.
3	Ground
4	+5V

J5 Reset Switch Jumper

JUMPER	DESCRIPTION
OPEN	Normal Mode
SHORT	System Reset

J5 Hard Drive LED

PIN	DESCRIPTION
1	+5V
2	GROUND

J5 Turbo LED

PIN	DESCRIPTION
1	Anode (+)
2	Ground

J5 Turbo Switch Jumper

PIN	DESCRIPTION
1	Ground
2	+5V

JP1 CMOS Battery Jumper

JUMPER	DESCRIPTION
1 - 2	Normal Mode (default)
2 - 3	Clear CMOS

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JP4 Flash ROM Voltage Jumper

JUMPER	DESCRIPTION
1 - 2	12 Volt Flash Programming (default)
2 - 3	5 Volt Flash Programming

J2 PS/2 Mouse Connector

PIN	DESCRIPTION
1	Mouse Clock
2	Ground
3	N.C.
4	Mouse Data
5	N.C.
6	N.C
7	N.C.
8	+5VDC

J3 Power Supply Connector

PIN	DESCRIPTION
1	Power Good
2	+5VDC
3	+12VDC
4	-12VDC
5	Ground
6	Ground
7	Ground
8	Ground
9	-5VDC
10	+5VDC
11	+5VDC
12	+5VDC

USB1 2 Channel USB Connector

PIN	DESCRIPTION
1,2	+5VDC
3,4	USB DATA (-)
5,6	USB DATA (+)
7,8	Ground
9,10	Ground

IR1 Infrared Device Connector

PIN	DESCRIPTION
1	IRS in
2	Ground
3	IRS out
4	+5VDC

PERFORMANCE RATED CPUs

AMD™ and Cyrix®/IBM® CPUs use an alternative form of clock speed rating called the performance rating. When installing one of those CPUs on one of our motherboards it is important to note that one must set the motherboard/CPU clock according to the internal clock of the CPU and not the performance rating. For example, the Cyrix® PR166+ doesn't run internally at 166MHz but rather, according to the Winstone96 benchmarking program, it runs like a similarly configured Intel Pentium® 166MHz CPU. The Cyrix® PR166+ internally runs at 133MHz so your motherboard's jumper settings should be set at 66MHz and a 2X CPU clock multiplier.

MAKE SURE YOU ARE USING THE RIGHT SETTINGS OR ELSE YOU WILL DEFINITELY ENCOUNTER PROBLEMS!

P-RATED SPEED	CLOCK (MHz)	CLOCK SETTINGS
CYRIX®/IBM® CPUs		
PR200+	150	75 X 2
PR166+	133	66 X 2
PR150+	120	60 X 2
PR133+	110	55 X 2
PR120+	100	50 X 2
AMD™ CPUs		
PR166	166	66 X 2.5
PR150	150	60 X 2.5
PR133	100	66 X 1.5
PR120	90	60 X 1.5
PR100	100	66 X 1.5
PR75	75	50 X 1.5

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[CPU configuration jumpers]

JP3, JP5 & JP6 CPU Configuration Jumpers

CPU			CPU CLOCK				CLK MULTIPLIER			DUAL VOLTAGE		
TYPE	PR#	MHz	JP3A	JP3B	JP3C	CLOCK	JP5A	JP5B	VALUE	JP6A	JP6B	TYPE
INTEL® PENTIUM® P54C		75	2 - 3	2 - 3	2 - 3	50MHz	1 - 2	1 - 2	1.5X	2 - 3	2 - 3	P54C
		90	2 - 3	2 - 3	1 - 2	60MHz	1 - 2	1 - 2	1.5X	2 - 3	2 - 3	P54C
		100	2 - 3	1 - 2	2 - 3	66MHz	1 - 2	1 - 2	1.5X	2 - 3	2 - 3	P54C
		120	2 - 3	2 - 3	1 - 2	60MHz	2 - 3	1 - 2	2.0X	2 - 3	2 - 3	P54C
		133	2 - 3	1 - 2	2 - 3	66MHz	2 - 3	1 - 2	2.0X	2 - 3	2 - 3	P54C
		150	2 - 3	2 - 3	1 - 2	60MHz	2 - 3	2 - 3	2.5X	2 - 3	2 - 3	P54C
		166	2 - 3	1 - 2	2 - 3	66MHz	2 - 3	2 - 3	2.5X	2 - 3	2 - 3	P54C
		180	2 - 3	2 - 3	1 - 2	60MHz	1 - 2	2 - 3	3.0X	2 - 3	2 - 3	P54C
		200	2 - 3	1 - 2	2 - 3	66MHz	1 - 2	2 - 3	3.0X	2 - 3	2 - 3	P54C
INTEL® PENTIUM® MMX™ P55C		166	2 - 3	1 - 2	2 - 3	66MHz	2 - 3	2- 3	2.5X	1 - 2	1 - 2	P55C
		200	2 - 3	1 - 2	2 - 3	66MHz	1 - 2	2- 3	3.0X	1 - 2	1 - 2	P55C
		233	2 - 3	1 - 2	2 - 3	66MHz	1 - 2	1 - 2	3.5X*	1 - 2	1 - 2	P55C
CYRIX® IBM® 6x86	PR120+	100	2 - 3	2 - 3	2 - 3	50MHz	2 - 3	1 - 2	2.0X	2 - 3	2 - 3	P54C
	PR133+	110	1 - 2	2 - 3	2 - 3	55MHz	2 - 3	1 - 2	2.0X	2 - 3	2 - 3	P54C
	PR150+	120	2 - 3	2 - 3	1 - 2	60MHz	2 - 3	1 - 2	2.0X	2 - 3	2 - 3	P54C
	PR166+	133	2 - 3	1 - 2	2 - 3	66MHz	2 - 3	1 - 2	2.0X	2 - 3	2 - 3	P54C
	PR200+	150	1 - 2	2 - 3	1 - 2	75MHz	2 - 3	1 - 2	2.0X	2 - 3	2 - 3	P54C
CYRIX® IBM® 6x86L	PR166+L	133	2 - 3	1 - 2	2 - 3	66MHz	2 - 3	1 - 2	2.0X	1 - 2	1 - 2	P55C
	PR200+L	150	1 - 2	2 - 3	1 - 2	75MHz	2 - 3	1 - 2	2.0X	1 - 2	1 - 2	P55C
CYRIX® IBM® 6X86MX	PR166	150	2 - 3	2 - 3	1 - 2	60MHz	2 - 3	2 - 3	2.5X	1 - 2	1 - 2	P55C
	PR200	166	2 - 3	1 - 2	2 - 3	66MHz	2 - 3	2 - 3	2.5X	1 - 2	1 - 2	P55C
	PR233	188	1 - 2	2 - 3	1 - 2	75MHz	2 - 3	2 - 3	2.5X	1 - 2	1 - 2	P55C
AMD™ K5	PR75	75	2 - 3	2 - 3	2 - 3	50MHz	1 - 2	1 - 2	1.5X	2 - 3	2 - 3	P54C
	PR100	100	2 - 3	1 - 2	2 - 3	66MHz	1 - 2	1 - 2	1.5X	2 - 3	2 - 3	P54C
	PR120	90	2 - 3	2 - 3	1 - 2	60MHz	1 - 2	1 - 2	1.5X	2 - 3	2 - 3	P54C
	PR133	100	2 - 3	1 - 2	2 - 3	66MHz	1 - 2	1 - 2	1.5X	2 - 3	2 - 3	P54C
	PR150	150	2 - 3	2 - 3	1 - 2	60MHz	2 - 3	2 - 3	2.5X	2 - 3	2 - 3	P54C
	PR166	166	2 - 3	1 - 2	2 - 3	66MHz	2 - 3	2 - 3	2.5X	2 - 3	2 - 3	P54C
AMD™ K6	PR2-166	166	2 - 3	1 - 2	2 - 3	66MHz	2 - 3	2 - 3	2.5X	1 - 2	1 - 2	P55C
	PR2-200	200	2 - 3	1 - 2	2 - 3	66MHz	1 - 2	2 - 3	3.0X	1 - 2	1 - 2	P55C
	PR2-233	233	2 - 3	1 - 2	2 - 3	66MHz	1 - 2	1 - 2	3.5X*	1 - 2	1 - 2	P55C

* TO GET A 3.5X MULTIPLIER FOR THE INTEL & AMD 233MHZ PROCESSORS YOU WILL NEED TO SET THE JUMPER SETTINGS TO 1.5X; THE SYSTEM BOARD WILL AUTOMATICALLY SET THE CLOCK MULTIPLIER TO 3.5X FOR THOSE PROCESSORS WHEN SET TO 1.5X

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JP7 CPU Voltage Regulator Output Jumpers

JP7A	JP7B	JP7C	JP7D	JP7E	DESCRIPTION
SHORT	OPEN	OPEN	OPEN	OPEN	3.5 Volts (P54C, 6x86, K5)
OPEN	SHORT	OPEN	OPEN	OPEN	3.3 Volts
OPEN	OPEN	SHORT	OPEN	OPEN	3.2 Volts (K6 PR2-233)
OPEN	OPEN	OPEN	SHORT	OPEN	2.9 Volts (K6 PR2-166 & PR2-200)
OPEN	OPEN	OPEN	OPEN	SHORT	2.8 Volts (P55C, 6x86L & M2)
OPEN	OPEN	OPEN	OPEN	OPEN	2.5 Volts

CAUTION: Make sure you correctly set your processor's voltage setting or else you may permanently damage your CPU and void any manufacturer's warranty.

J6 CPU Fan Power Connector

PIN	DESCRIPTION	PIN	DESCRIPTION
1	+12V	3	Ground
2	Ground	4	+5V

Memory Configurations

	BANK 0		BANK 1			
	SIMM1	SIMM2	SIMM3	SIMM4	DIMM1	DIMM2
1	4MB-32MB	4MB-32MB	NONE	NONE	NONE	NONE
2	NONE	NONE	4MB-32MB	4MB-32MB	NONE	NONE
3	4MB-32MB	4MB-32MB	4MB-32MB	4MB-32MB	NONE	NONE
4	NONE	NONE	4MB-32MB	4MB-32MB	8MB-128MB	NONE
5	4MB-32MB	4MB-32MB	NONE	NONE	NONE	8MB-128MB
6	NONE	NONE	NONE	NONE	8MB-128MB	NONE
7	NONE	NONE	NONE	NONE	NONE	8MB-128MB
8	NONE	NONE	NONE	NONE	8MB-128MB	8MB-128MB

- The maximum on-board memory cannot exceed 512MB in any combination (SIMM + DIMM).

- All SIMM sockets can use either Fast Page Mode or EDO DRAM memory modules.

- All DIMM sockets can use either Fast Page Mode, EDO DRAM or SDRAM memory modules.

- If SDRAM modules are installed then JP2 must be set for 3.3V. Otherwise, leave the memory module voltage setting to 5.0V.

- If both DIMM sockets are used, they must both use the same voltage.

JP2 DIMM Module Voltage Selector

JP2A	JP2B	DESCRIPTION
2 - 3	2 - 3	For SDRAM DIMM modules (3.3 V)
1 - 2	1 - 2	For EDO DRAM/Fast Page Mode DIMM Modules (5V)

2.1 GB BARRIER

Today's hard drives allow you to store much more information than was once possible. However, while hard drive sizes have grown expotentially, the capability of your operating system (OS) to handle such capacity has not grown in a similar rate. MS-DOS®, Windows 95®, and OS/2® are limited to 2.1 GB in the primary drive partition because they use a 16-bit File Allocation Table (FAT). Therefore a second partition is needed to fully utilize all the storage space of your drive. At the time of this writing, only Windows 95® OSR2 and Windows NT® were able to have partitions larger than 2.1 GB because they use the new 32-bit FAT.

Due to the frequent upgrades of the Award BIOS, this manual may not include descriptions of all the features available to you in your current BIOS.

WARNING: Do not change the settings in the BIOS unless you know EXACTLY what you are doing or when told to do so by a trained technician. Changing any of the BIOS settings, may affect the performance of your system and can also cause your system to hang.

• **DATE/TIME/DAYLIGHT SAVINGS** - You can set the date, time, and whether or not you would like to enable daylight savings time with this option. Press the left or right arrows to toggle between fields and press the PgUp or PgDn keys to change the settings accordingly.

• **HARD DISKS** - The AWARD BIOS supports up to four IDE drives. However, it does not show you information about such IDE drives such as a CD-ROM nor will it point out such hard drive types as a SCSI drive. *We highly recommend that you auto detect your IDE drives since* the BIOS can automatically detect the specifications and optimal operating modes of your IDE hard drives. If you do not want to AUTO DETECT your drive types, you will need to enter the type, # of cylinders, # of heads, landing zone, # of sectors and the translating mode.

• **FLOPPY DRIVES** - The BIOS supports the following floppy drive formats for drive A & B: None, 360K 5.25 in, 1.2M 5.25 in, 720K 3.5 in, & 1.44M 3.5 in.

• **VIDEO** - The BIOS supports the following types of primary video subsystems in your computer: EGA/VGA, CGA40, CGA80, & MONO. The BIOS usually detects the correct video type automatically.

• **HALT ON** - During the power-on self-test (POST), you can select whether or not the computer will pause when it detects an error in your system. You can select from: no errors, all errors, all but keyboard, all but diskette or all but diskette/keyboard.

• **MEMORY** - The memory figures are only for your information and they cannot be altered in any way. They are automatically detected by the BIOS.

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- **VIRUS WARNING** - This will warn you if a program i.e. virus tries to write to the boot sector or partition table of your drive.

- **CPU INTERNAL CACHE /EXTERNAL CACHE** - Cache memory is used to hold data frequently used by the CPU thus increasing performance since it bypass accessing information from slower main memory. Internal cache (L1) is memory built into the CPU itself and external cache (L2) is on the system board.

- **QUICK POWER ON SELF TEST** - Select ENABLED to reduce the amount of time required to run the power-on self-test (POST) since it skips some specific tests during bootup.

- **BOOT SEQUENCE** - You can choose where your computer will look for its operating system first and in what order.

- **SWAP FLOPPY DRIVE** - This will allow you to change the letter assignments of your floppy drives.

- **BOOT UP FLOPPY SEEK** - Only enable this setting if you have 360-KB floppy drives to save wear and tear on your drives.

- **BOOT UP NUMLOCK STATUS** - When On, the keypad gives you numbers instead of directional instructions.

- **BOOT UP SYSTEM SPEED** - On HIGH, your system will boot at CPU speed and on LOW, it will boot at your AT bus speed.

- **IDE HDD BLOCK MODE** - If your IDE hard drive can support block mode, it will detect the optimal number of read/writes per sector, when enabled.

- **GATE A20 OPTION** - Gate A20 refers to how the system handles memory over 1MB. When FAST, the board chipset controls it & when NORMAL, the keyboard controller handles it.

- **TYPEMATIC RATE SETTING** - You can select the rate that keystrokes repeat and the delay before keystrokes repeat.

- **SECURITY OPTION** - If your password option is enabled, you can select when a password is needed for access.

- **IDE 2ND CHANNEL CONTROL** - If you're not using the 2nd built-in IDE channel, disable this so you can free up IRQ 15.

- **PS/2 MOUSE FUNCTION CONTROL** - If you are not using the PS/2 mouse, select DISABLE to free up IRQ 12.

- **ASSIGN IRQ TO VGA** - Some high end video cards require an IRQ to preform quicker screen refreshes. Check your video card manual for more details.

- **PCI/VGA PALETTE SNOOP** - When ENABLED, the system ensures consistency of display data for multiple video cards.

- **OS SELECT FOR DRAM > 64MB** - Select OS2 only if you are using the OS/2 operating system with more than 64 MB.

- **SHADOW** - Shadowing copies peripheral firmware ROM Bios from 8 bit ROM into faster 16-bit or 32-bit system RAM. Shadowing improves BIOS & firmware ROM performance, but reduces the amount of high memory (640 KB to 1 MB) available.

POST ERROR MESSAGES

During bootup, your BIOS may beep and display a particular error with your system. Here is a partial list of errors and a description of what they mean:

BEEP - This error message tells the user that a video error has occurred and that BIOS cannot display anything. It is the only beep code that you will hear from this BIOS.

BIOS ROM CHECKSUM ERROR - This means that the checksum of the BIOS code is corrupted. Reboot and reset your BIOS settings.

CMOS BATTERY FAILED - This indicates that the CMOS battery is no longer functional and needs to be replaced.

FLOPPY DISK(S) FAIL - This means that your drive cannot be initialized by the BIOS. Make sure it is installed correctly, physically & in BIOS.

KEYBOARD ERROR - The BIOS can't detect the keyboard. Make sure it is attached correctly and that the keylock is disabled.

OVERRIDE ENABLED - DEFAULTS LOADED - The system can't boot with your current settings and the default settings are automatically loaded.

PRIMARY/SECONDARY MASTER/SLAVE HARD DISK FAIL - This means that the indicated drive is unable to be utilized by the BIOS. Make sure it is correctly installed, physically & in BIOS.

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GROUNDING YOURSELF

The most common danger to the motherboard and its components is electrostatic discharge. Protect your computer with these tips:

1. Try NOT to work in places where there is a high possibility of static buildup i.e. carpeted rooms.

2. DON'T hand a computer part from one person to another. Place the part on the table first AND then pick it up.

3. Consider using an electrostatic wrist strap or mat to help prevent buildup.

4. Before handling any component, eliminate all static that you might be carrying by touching the unpainted metal frame of your case.

Though taking these precautions may seem like a waste of time, realize that "spending" a few seconds now to ground yourself, might just save you a load of time and money in the future.

•**AUTO CONFIGURATION** - When enabled, the bios automatically uses predetermined optimal values of chipset options. When DISABLED, the bios uses the chipset values selected by the user. The ENABLED setting requires that you choose the access speed of your memory in nanoseconds (located on the individual ram chips on your DRAM module).

•**SYSTEM BIOS CACHEABLE** - Enabling this option, allows for increase performance due to caching of the system BIOS ROM at memory address, F0000h-FFFFFh into faster main memory. However, if any data is written into this memory address, a system error may occur.

•**VIDEO RAM CACHEABLE** - Enabling this option, allows for increase performance due to caching of the video BIOS ROM at memory address, C0000h-C7FFFh into faster main memory. However, if any data is written into this memory address, a system error may occur.

•**CACHE TIMING** - This option determines the rate in which the cache acquires information. The usual clock cycle notation (i.e. 4-1-1-1) has been replaced with a more user friendly notation (fast, fastest). FASTEST offers higher performance than FAST but FAST is a more reliable, conservative setting.

•**DRAM TIMING CONTROL** - This option determines the rate in which the DRAM read/write cycle is completed. The usual clock cycle notation (i.e. x444) has been replaced with a more user friendly notation (normal<medium<fast<turbo). TURBO offers higher performance than NORMAL but NORMAL is a more reliable, conservative setting.

•**REDUCE DRAM LEADOFF CYCLE** - This option allows you to reduce the number of CPU clocks allowed before reads and writes to DRAM are performed. Enabling this option offers higher performance.

•**SDRAM SINGLE/BURST WRITE** - This determines the way SDRAM reads/writes data. When SINGLE, the memory controller needs to be prompted before every line of data is transferred, while the BURST setting eliminates this step. BURST offers higher performance than SINGLE but SINGLE is a more reliable, conservative setting.

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- **POWER MANAGEMENT** - This option allows you to disable or select the level of power saving for your system. Select from max saving, min saving & user define settings

- **PM CONTROL BY APM** - If you have Advanced Power Management on you system, enable this option to give you better power savings.

- **VIDEO OFF OPTION & VIDEO OFF METHOD** - These options allows you to determine when and the method in which your monitor is blanked during power saving functions. Choose from V/H SYNC + Blank, DPMS, and Blank Screen.

- **MODEM USE IRQ** - Lets you assign your modem IRQ for wake up features.

- **PM TIMERS** - This option allows you select the system inactivity time before the each of Green PC power saving functions are enabled. The modes are as follows: doze mode (CPU slows down), HDD power down mode (hard drive powers down), and suspend mode (everything but CPU is turned off).

- **PM EVENTS** - You can disable IRQ specific and peripheral specific wake-up events so that they do not awaken the system from suspend mode.

THE GREEN PC

Your computer is definitely an electricity guzzler. In the last few years you might have noticed that many monitors, printers and computers have power saving features built into them. The idea behind this was that during a period of inactivity these components would run at a slower speed or shut off completely.

This motherboard has full power saving features and adheres to Energy Star, Display Power Management Signaling (DPMS) and Advanced Power Management (APM) standards.

Energy Star - The EPA's program to encourage manufacturers to build computer components that are energy efficient by allowing qualifying products to display their logo.

DPMS - This is a requirement of certain signaling instructions to be incorporated into monitors, video cards and motherboards that allow monitors to enter a sleep mode or be awaken via an instruction from the video card.

APM - This is a standard created by Intel® & Microsoft® so that the motherboard BIOS, operating systems, or applications are able to handle certain power saving features.

Though the features of this board allow you to reduce your wattage consumption while your computer is not being used, the best saving of all is zero watts; when your unused computer is turned off.

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TROUBLESHOOTING GUIDE

The basic principle in troubleshooting is basically "replace and reboot." For example, if you suspect that your memory is faulty, replace it with different memory and reboot the computer to see if it works properly. If it works, then you can deduce that your problem most likely linked to your memory and its configuration.

Another basic principle of troubleshooting, is starting off with a "barebones" configuration. A barebones configuration consist of your system with the most minimal amounts of peripherals and components required for operation. One scenario for a pentium class system might include your hard drive, your CPU, 2 pieces of memory, and the video card. If you are unable to get this configuration going, then it is quite obvious that one or more of these items are at fault. But if you are able to get this setup working, you would then add one card or peripheral at a time until your faulty component is revealed. Doing this will cut down the time spent in the troubleshooting process since you only have to deal with a few number of items at a time.

In most cases, the number one problem of a system failing to boot or work properly is due NOT to broken hardware, but rather to misconfigured settings and misinstalled components. So check your jumper settings, your cables, IRQs, DMAs, I/O addresses, and device drivers first before you contact your vendor for help!

• **RESOURCES CONTROLLED BY** - This allows your Plug and Play BIOS to automatically configure your boot-up & Plug and Play devices and assign IRQs and DMAs to your peripherals. When set to MANUAL, you can assign each IRQ and DMA for either Legacy ISA or PCI/ISA PnP usage.

• **RESET CONFIGURATION DATA** - When enabled, it will reset the Extended System Configuration DATA (ESCD) when you exit BIOS. It is normally off.

• **CPU TO PCI WRITE BUFFER** - This buffer between the CPU and the PCI allows the much faster CPU to move on to other operations once it is done transferring information to the slower PCI slots and their peripherals. Therefore, the CPU doesn't have to wait until the PCI slot has completed receiving all the information, before moving on.

• **PCI IRQ ACTIVATED BY** - This function designates the way the PCI bus recognize an IRQ request. You should leave it as the default (EDGE or LEVEL) unless otherwise indicated by your PCI card.

• **PCI IDE IRQ MAP TO** - This option lets you select whether or not your IDE controller is a ISA or PCI device. If it is a PCI peripheral, you will need to select what slot the PCI IDE card is in. Set to PCI-AUTO if you are using the on-board IDE controller.

• **PRIMARY/SECONDARY IDE INT#** - You can select an interrupt (INT#A, INT#B, INT#C, or INT#D) for each of your IDE channels with this option.

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• **ON-CHIP PRIMARY/SECONDARY PCI IDE** - The on-board I/O supports a two channel IDE interface. You can control each channel separately.

• **IDE PREFETCH MODE** - Enables/Disables the prefetch buffers in the PCI IDE controller. The prefetch buffers are used as an temporary storage place as data is transferred from one location to another.

• **IDE PRIMARY/SECONDARY MASTER/SLAVE PIO** - It lets you set a PIO mode (0-4) for each of the four possible IDE devices of the on-board I/O. When Auto is selected, the BIOS assigns the best transfer mode.

• **ON-BOARD FDD CONTROLLER** - Enable this to use the On-board FDD.

• **ON-BOARD SERIAL PORT 1/2** - Assigns an I/O & COM address to your serial port. When Auto is selected, the BIOS automatically assigns free I/O and COM addresses to your serial ports.

• **ON-BOARD PARALLEL PORT** - Assigns an I/O address & IRQ to your parallel port.

• **PARALLEL PORT MODE** - This allows you to select the operating mode of the parallel port. Choose from SPP, EPP and ECP.

• **ECP MODE USE DMA** - Select a DMA channel for the port.

CABLING YOUR PERIPHERALS

Many problems such as your system not booting up or your peripherals not functioning correctly can be averted by making sure your cables are properly installed. Here's two tips to help you save time figuring this out:

On each cable, there is a striped or colored wire signifying it being pin one. This is to make sure that your cable is not upside down when you plug it in. More often than not, the pin one on your peripheral is the pin that is adjacent from the power supply cable. So if that is just the case, simply orient your cable with the marked wire, towards the side of your peripheral with the power supply connection.
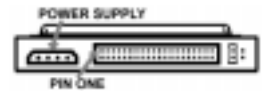
On the other end, our board's I/O ports usually have a notch on the surrounding plastic socket so that cables with an extruding notch can quickly plug into them without any hassle of locating pin one. For cables without this notch, you will need to find the corresponding pin one which is usually indicated by an arrow or a "1" near it.

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