

PAM-0073I

High Performance

Pentium PCI ATX Mainboard

User's Guide



Edition 1.20

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P/N: 155100-8559



CAUTION

The motherboard is an electrostatic sensitive device. Don't open or handle except at a static-free workstation.

POWER OFF

It needs to hold the power switch 4 seconds to turn off the power.

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CONTENTS

CHAPTER 1	INTRODUCTION	1
CHAPTER 2	JUMPER SETTINGS	5
2.1	JUMPERS PRESENTATION	5
2.2	CPU TYPE	5
2.2.1	INTEL PENTIUM CPU	5
2.2.2	INTEL PENTIUM w/ MMX™ TECH (P55C) CPU	6
2.2.3	AMD-K6 CPU	7
2.2.4	AMD-K5 CPU	7
2.2.5	CYRIX 6x86 CPU	8
2.2.6	CYRIX 6x86L CPU	9
2.3	GRAPHICAL DESCRIPTION OF JUMPER SETTINGS	10
2.4	CPU VOLTAGE	11
2.5	CPU SPEED (U13)	14
2.6	JP3 - VOLTAGE SELECTION FOR SYSTEM ROM	15
2.7	JP11 - RING IN SELECT	15
2.8	MEMORY CONFIGURATION	16
CHAPTER 3	CONNECTOR CONFIGURATION	19
3.1	J1 - MULTIPLE FUNCTION JUMPER	20
3.2	JP4 - IrDA/FAST IR CONNECTOR	20
3.3	J11 - ATX POWER CONNECTOR	21
3.4	J9 - FLOPPY DRIVE CONNECTOR	21
3.5	J6, J7 - PRIMARY/SECONDARY IDE CONNECTORS	21
3.6	PS/2 KEYBOARD CONNECTOR	22
3.7	PS/2 MOUSE CONNECTOR	22
3.8	UNIVERSAL SERIAL BUS PORTS 0 & 1	22
3.9	PARALLEL PORT CONNECTOR	22
3.10	SERIAL PORT COM1, COM2	22
CHAPTER 4	AMI BIOS SETUP	23
4.1	STARTING AMIBIOS SETUP	23
4.2	AMIBIOS SETUP MAIN MENU	23
4.3	STANDARD CMOS SETUP	24
4.4	ADVANCED CMOS SETUP	25
4.5	ADVANCED CHIPSET SETUP	30
4.6	POWER MANAGEMENT SETUP	31
4.7	PCI/PnP SETUP	33
4.8	PERIPHERAL SETUP	36
4.9	AUTO CONFIGURATION WITH OPTIMAL SETTINGS	38
4.10	AUTO CONFIGURATION WITH FAIL SAFE SETTINGS	38

CHAPTER 5	FLASH MEMORY UTILITY	39
APPENDIX A	QUICK GUIDE	41

CHAPTER 1

INTRODUCTION

Preface

The motherboard is a mini ATX form factor high performance all in one mainboard. It is developed around the pentium microprocessor with 64 bit access to data transfer and MMX technology. It includes Intel 82430TX System Chipset, SMC 669 Super I/O Chip.

Features

Processor

- Intel Pentium/MMX, Cyrix 6x86/6x86L/6x86MX and AMD K5/K6 CPU.
- The mainboard can run with following speeds:
90, 100, 110, 120, 133, 150, 166, 200, 233 and 266 MHz

Chipset

- Intel 82439TX (Intel 82430TX System Controller)
- Intel 82371AB (PCI ISA IDE Xcelerator)
- SMC 669 (Super I/O Controller)

Cache Size

- Built in 0/256/512KB Synchronised Pipelined Burst Mode SRAM to achieve the high Pentium system performance.

Main Memory

- Support Mixed Memory Technologies: Extend Data Output (EDO), Standard Page Mode (SPM), Fast Page Mode (FPM) and Synchronous DRAM (SDRAM) SIMM can work together.
- Memory configurations from 4MB to 256MB are possible using combination of 512K*32 to 8M*32 SIMM module (32 bit no-parity 72-pin SIMM module) and 2M*32 to 8M*32 SDRAM DIMM module.
- DIMM socket for SDRAM (3.3V unbuffered).

Multi I/O

- On board Multi-I/O supports two serial, one parallel ports and floppy drive controller.
- Serial ports are 16550 Fast UART compatible.
- Parallel port has EPP and ECP capabilities.
- PS/2 keyboard and PS/2 mouse connector is provided.
- IrDA or Fast IR is provided.
- Two standard USB connectors are provided.

Chapter 1

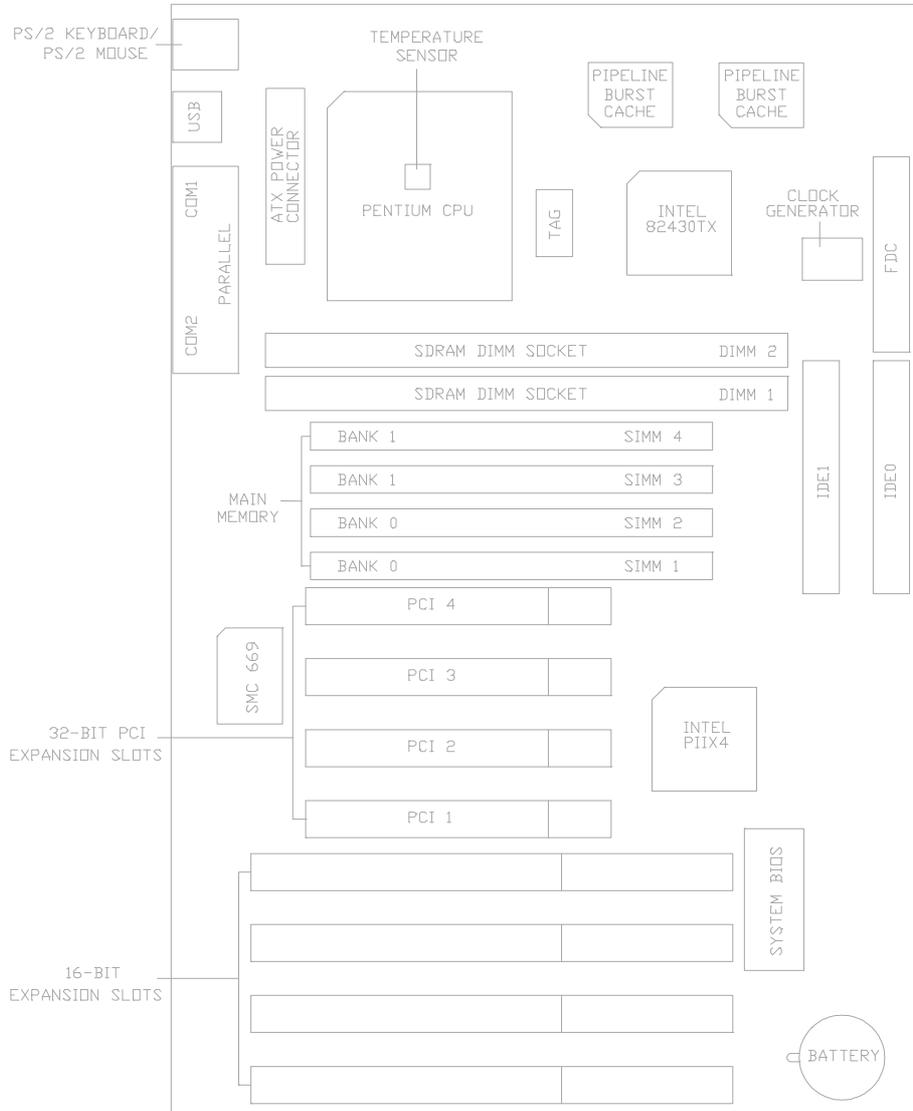


Fig. 1 Key Components of the Mainboard

PCI IDE

- On board supports PCI Master IDE Controller, two connectors support up to four IDE devices such as HDD, CD ROM drive and Tape Back-up drives LS-120, etc.
- PCI Master IDE controller supports PIO Mode 3 and 4 devices, I/O data transfer rate can be up to 17Mb/s. DMA mode transfer rate can be up to 22Mb/s.
- Ultra DMA Mode supported. Transfer rate can be up to 33Mb/s.

System BIOS

- AMI BIOS (1M Flash ROM).

Slots

- Four PCI slots
- Four ISA slots

Others

- CPU overheat alarm system.

Form Factor

- 304mm (W) x 210mm (L) 4 Layer

Environment

Working Specifications

Actual Field MTBF (hours)	104,515 hours
Preventive Maintenance	Not Required

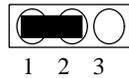
Environmental Limits

	Operating	Non-operating
Temperature	0 to 50 degree Celsius	-10 to 65 Degree Celsius
Relative Humidity (without condensation)	8 to 85%	5 to 95%
Altitude	10,000ft	40,000ft
Vibration	1,000Hz	
Electricity	4.75 ~ 5.25V	

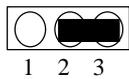
CHAPTER 2

JUMPER SETTINGS

2.1 JUMPERS PRESENTATION



Pins 1 and 2 are shorted with a jumper cap.



Pins 2 and 3 are shorted with a jumper cap.



The jumper is shorted when the jumper cap is placed over the two pins of the jumper.



The jumper is open when the jumper cap is removed from jumper.

2.2 CPU TYPE

2.2.1 INTEL PENTIUM CPU

The pentium processors have different operation voltage. In order to using the CPU Voltage correctly, the following is the marking for identify the CPU type.



**Fig. 2a CPU Description
(Bottom Side)**

Description :

X = Voltage Specification (S or V)

S = Standard Voltage (3.4V)

V = VRE 3.4 - 3.6V (3.5V)

Z = Dual Processing Support (S or U)

S = Support DP/MP/UP

U = Not tested to support DP

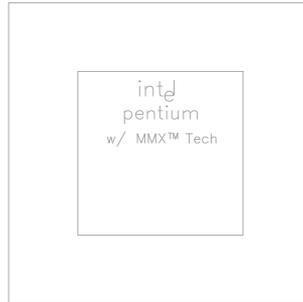
Y = Timing Specification (S or M)

S = Standard EDS timings

M = Min Valid Delay Spec.

2.2.2 INTEL PENTIUM w/ MMX™ TECH (P55C) CPU

The Intel Pentium w/ MMX™ Tech (P55C) CPU is offered with dual voltage supply - 2.8V for core and 3.3V (I/O) interface. The following is the marking for identify the CPU type. (The following diagram is provided as an example only. It does not necessarily indicate a valid product marking.)



**Fig. 2b CPU Description
(Top Side)**

	I/O Voltage	Core Voltage
Intel Pentium w/ MMX™ Tech (P55C)	3.3V	2.8V

2.2.3 AMD-K6 CPU

The AMD-K6 CPU family require dual voltage power for operation. The AMD-K6-PR166 and AMD-K6-PR200 require a voltage of 2.9V for the core and 3.3V for the I/O. The AMD-K6-PR233 require a voltage of 3.2V for the core and 3.3V for the I/O. (The following diagram is provided as an example only. It does not necessarily indicate a valid product marking.)

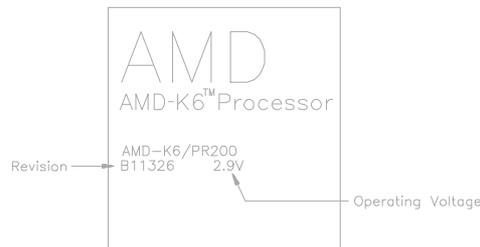


Fig. 2c CPU Description (Top Side)

Operating Voltage	I/O Voltage	Core Voltage
2.9V	3.3V	2.9V
3.2V	3.3V	3.2V

2.2.4 AMD-K5 CPU

The AMD-K5 family CPU operates on different operation voltage depending on the CPU type. The operating voltage can be known through the marking on the surface of the CPU. (The following diagram is provided as an example only. It does not necessarily indicate a valid product marking.)

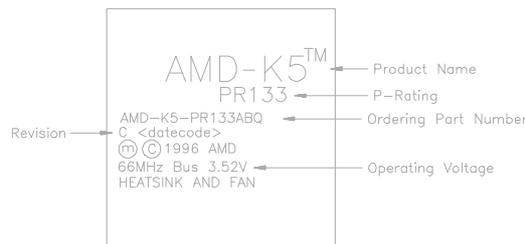
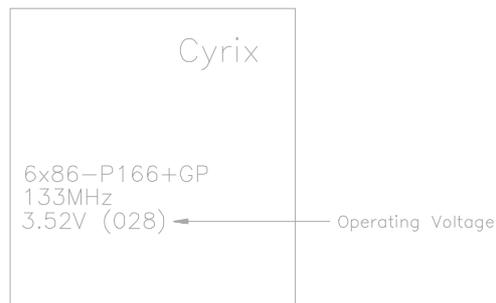


Fig. 2d CPU Description (Top Side)

2.2.5 CYRIX 6x86 CPU

The Cyrix 6x86 has different nominal voltage depends on different lot. Please refer to the CPU marking.



**Fig. 2e CPU Description
(Top Side)**

Marketing	Recommended Nominal Voltage
3.3V or 3.52V	3.52V
028	3.52V
016	3.3V
Blank	3.52V

2.2.6 CYRIX 6x86L CPU

The Cyrix 6x86L has different I/O and core voltage. Please refer to the CPU marking.



**Fig. 2f CPU Description
(Top Side)**

	I/O Voltage	Core Voltage
Cyrix 6x86L CPU	3.3V	2.8V

2.3 GRAPHICAL DESCRIPTION OF JUMPER SETTINGS

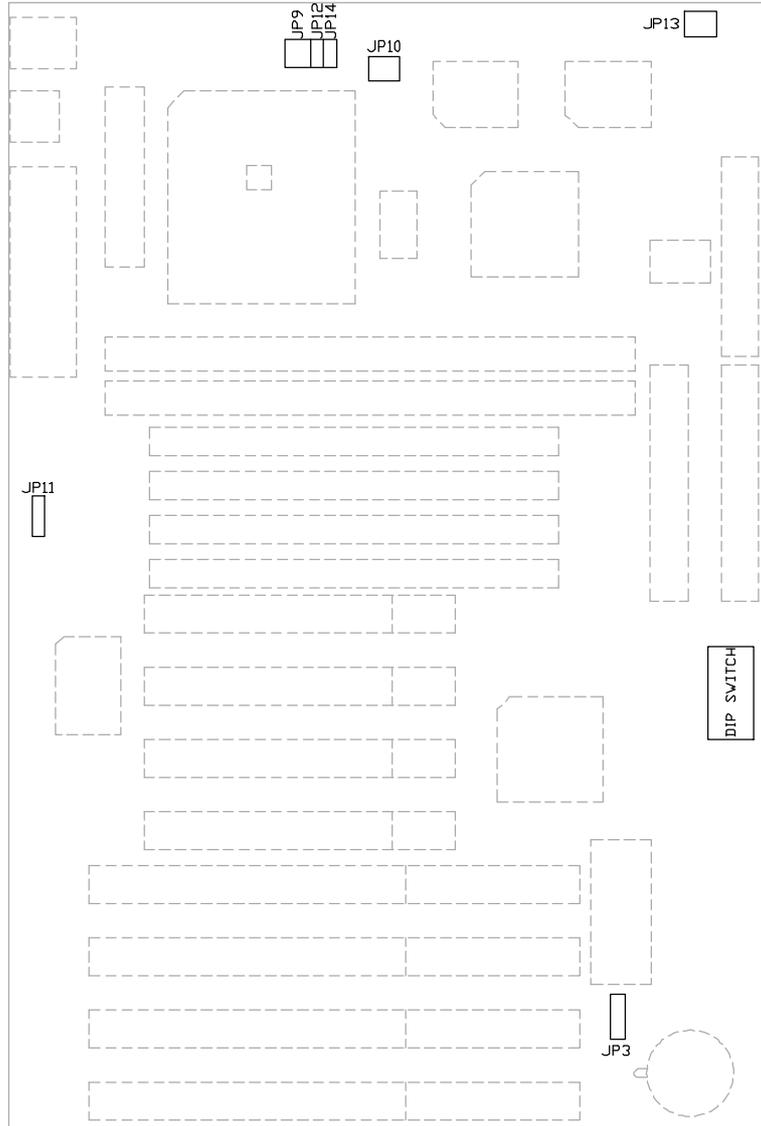


Fig. 3 Connector Location of the mainboard

2.4 CPU VOLTAGE

1. 3.3V Single Voltage CPU: P54C, P54CT

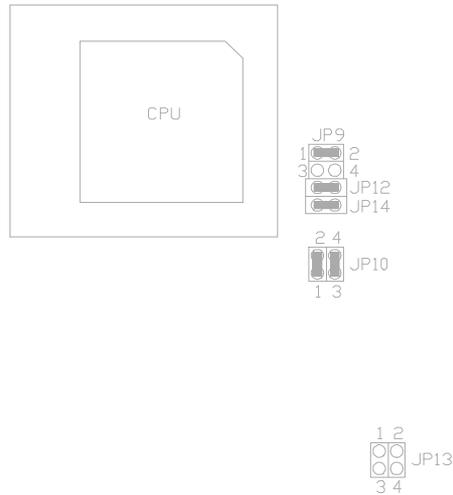


Fig. 4a CPU Type - 3.3V

2. 3.5V Single Voltage CPU: P54C-VRE, AMD-K5, Cyrix 6x86

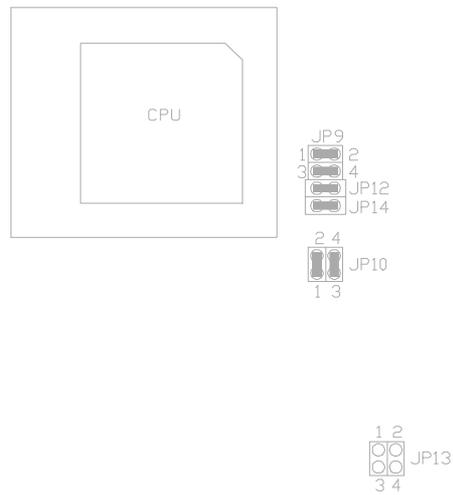


Fig. 4b CPU Type - 3.5V

Chapter 2

3. 3.3V (I/O)/2.8V (core) Dual Voltage CPU: P55C, Cyrix 6x86L

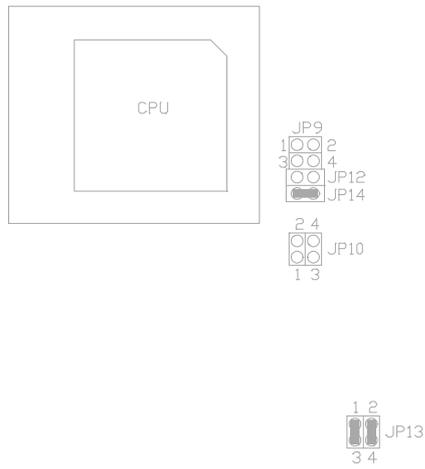


Fig. 4c CPU Type - 3.3V/2.8V

4. 3.3V (I/O)/2.9V (core) Dual Voltage CPU: AMD-K6-PR166/PR200, Cyrix 6x86MX

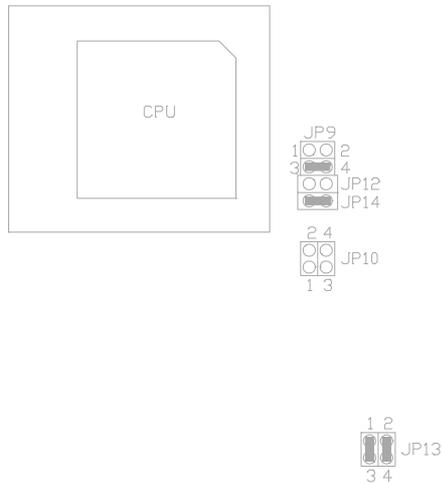


Fig. 4d CPU Type - 3.3V/2.9V

5. 3.3V (I/O)/3.2V (core) Dual Voltage CPU: AMD-K6-PR233

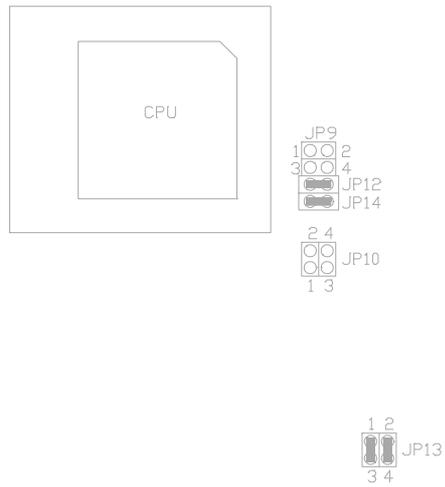


Fig. 4e CPU Type - 3.3V/3.2V

2.5 CPU SPEED (U13)

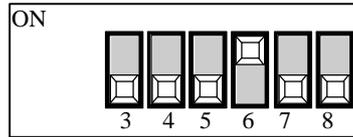


Fig. 5

CPU Type	Freq.	Ration	Bus Freq.	Freq. Ration Setting			Bus Freq. Setting		
				SW1-3	SW1-4	SW1-5	SW1-6	SW1-7	SW1-8
Intel Pentium	90MHz	1.5x	60MHz	OFF	OFF	OFF	ON	OFF	OFF
Intel Pentium	100MHz	1.5x	66MHz	OFF	OFF	OFF	OFF	OFF	OFF
Intel Pentium	120MHz	2.0x	60MHz	ON	OFF	OFF	ON	OFF	OFF
Intel Pentium	133MHz	2.0x	66MHz	ON	OFF	OFF	OFF	OFF	OFF
Intel Pentium	150MHz	2.5x	60MHz	ON	ON	OFF	ON	OFF	OFF
Intel Pentium	166MHz	2.5x	66MHz	ON	ON	OFF	OFF	OFF	OFF
Intel Pentium	200MHz	3.0x	66MHz	OFF	ON	OFF	OFF	OFF	OFF
Intel Pentium w/MMX	166MHz	2.5x	66MHz	ON	ON	OFF	OFF	OFF	OFF
Intel Pentium w/MMX	200MHz	3.0x	66MHz	OFF	ON	OFF	OFF	OFF	OFF
Intel Pentium w/MMX	233MHz	3.5x	66MHz	OFF	OFF	OFF	OFF	OFF	OFF
AMD-K5-PR120	120MHz	2.0x	60MHz	ON	OFF	OFF	ON	OFF	OFF
AMD-K5-PR133	133MHz	2.0x	66MHz	ON	OFF	OFF	OFF	OFF	OFF
AMD-K5-PR166	166MHz	2.5x	66MHz	ON	ON	OFF	OFF	OFF	OFF
AMD-K6/166	166MHz	2.5x	66MHz	ON	ON	OFF	OFF	OFF	OFF
AMD-K6/200	200MHz	3.0x	66MHz	OFF	ON	OFF	OFF	OFF	OFF
AMD-K6/233	233MHz	3.5x	66MHz	OFF	OFF	OFF	OFF	OFF	OFF
Cyrix 6x86L-PR150	120MHz	2.0x	60MHz	ON	OFF	OFF	ON	OFF	OFF
Cyrix 6x86L-PR166	133MHz	2.0x	66MHz	ON	OFF	OFF	OFF	OFF	OFF
Cyrix 6x86L-PR200	150MHz	2.0x	75MHz	ON	OFF	OFF	OFF	ON	OFF
Cyrix 6x86MX-PR166	150MHz	2.5x	60MHz	ON	ON	OFF	ON	OFF	OFF
Cyrix 6x86MX-PR200	150MHz	2.0x	75MHz	ON	OFF	OFF	OFF	ON	OFF
Cyrix 6x86MX-PR200	166MHz	2.5x	66MHz	ON	ON	OFF	OFF	OFF	OFF
Cyrix 6x86MX-PR233	188MHz	2.5x	75MHz	ON	ON	OFF	OFF	ON	OFF

Table 1

Reserve for future support

2.6 JP3 - VOLTAGE SELECTION FOR SYSTEM ROM

1. 5V Flash EPROM on System ROM



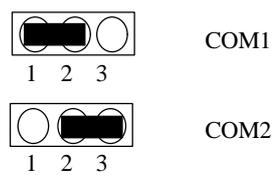
Fig. 6a

2. 12V Flash EPROM on System ROM



Fig. 6b

2.7 JP11 - RING IN SELECT



The motherboard will wake up from sleep mode when a ring in signal is detected from the com port.

2.8 MEMORY CONFIGURATION

The mainboard lets user upgrade system memory via SIMM and DIMM sockets on the mainboard.

Four SIMM sockets (SIMM1, SIMM2, SIMM3, SIMM4) are provided for SPM, FPM and EDO RAM SIMM and two DIMM sockets (DIMM1, DIMM2) are available for the SDRAM or 3.3V EDO DIMM.

*Note: The type of SIMM1/SIMM2 must be same.
The type of SIMM3/SIMM4 must be same.
SIMM1/SIMM2 and DIMM1 cannot co-exist.
SIMM3/SIMM4 and DIMM2 cannot co-exist.*

Table 1 provides some typical memory configuration supported by the mainboard.

Onboard memory is located in two banks:

Bank 0: SIMM1 & SIMM2
OR
DIMM1

Bank 1: SIMM3 & SIMM4
OR
DIMM2

The total memory size is 8-256MB and various configuration of DRAM types in the following table are for reference:

Bank 0 (SIMM 1,2/DIMM1)	Bank 1 (SIMM 3,4/DIMM2)
Single	None
None	Single
Single	Single
Single	Double
Double	Single
Double	None
None	Double
Double	Double

Table 2

Jumper Settings

Single means Single side SIMM Module or Single side DIMM Module. The size of Single side SIMM can be 4MB, 16MB, 64MB and the size of Single side DIMM can be 8MB, 32MB, 128MB.

Double means Double side SIMM Module or Double side DIMM Module. The size of Double side SIMM can be 8MB, 32MB and the size of Double side DIMM can be 16MB, 64MB.

****Note:** *based on above chart, the different types of SIMM can be in different bank, but within same bank, the two SIMM modules must be of same type and size. Moreover, it is not recommended to installed the 5V SIMM and 3.3V DIMM at the same time.*

CHAPTER 3

CONNECTOR CONFIGURATION

Once the mainboard has been fastened into system case, the next step is to connect the internal cables and external cables. The mainboard connectors have varying numbers of pins and are the points of contact between the mainboard and other parts of the computer.

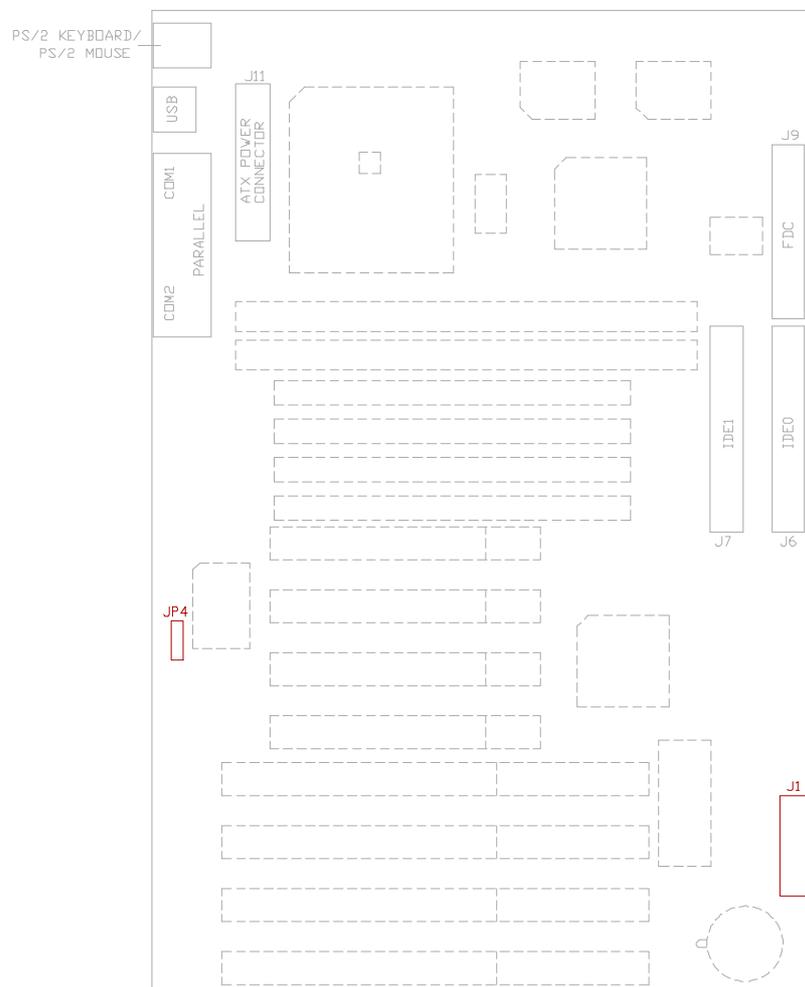


Fig. 7 Connector Location

3.1 J1 - MULTIPLE FUNCTION JUMPER

J1 is a front panel multi-function jumper include speaker, reset, keylock, Harddisk LED, ATX power button. The pin definition is as following figure.

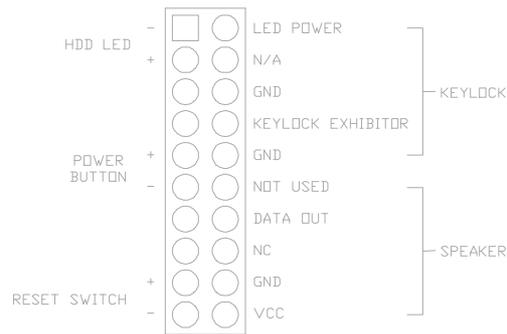


Fig. 8 Multiple Function Jumper

The power is turned on by short the power button once. And it needs to hold the power button about 4 seconds to turn if off when it has not start to display.

3.2 JP4 - IrDA/FAST IR CONNECTOR

JP4 is a four pin connector, which use the UART2 as interface for IrDA. You must also configure the setting through “UART2 Mode” is Integrated Peripheral Setup to select whether UART2 is used for COM2 or HPSIR/SKSIR. The pin definition is as following:

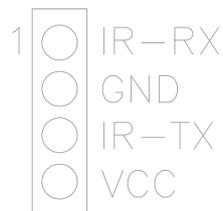


Fig. 9 IrDA/Fast IR Connector

3.3 J11 - ATX POWER CONNECTOR

J11 is a 2x10 pin male header connector. Plug the power connector of the ATX power supply onto the connector.

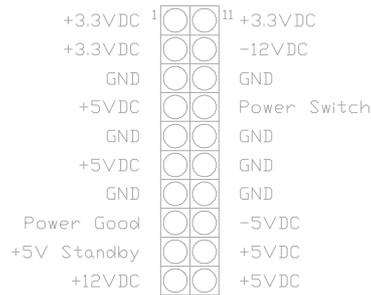


Fig. 10 ATX Power Connector

3.4 J9 - FLOPPY DRIVE CONNECTOR

This connector supports the floppy drive ribbon cable. After connecting the single end to the board, connect the two plugs on the other end to the floppy drive.

3.5 J6, J7 - PRIMARY/SECONDARY IDE CONNECTORS

These connectors support the provided IDE hard disk ribbon cable. After connecting the single end to the board, connect the two plugs on the other end to your hard disk.

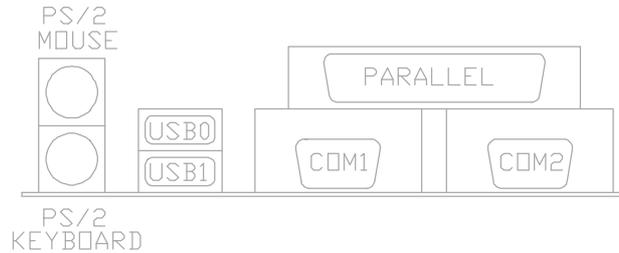


Fig. 11 Connector

3.6 PS/2 KEYBOARD CONNECTOR

This connector is a six-pin female mini DIN connector using a PS/2 plug. If a standard AT size keyboard plugs, you may use the DIN to mini DIN adaptor.

3.7 PS/2 MOUSE CONNECTOR

This connector is a six-pin female mini DIN connector using a PS/2 plug. Plug the jack on the PS/2 keyboard cable into this connector.

3.8 UNIVERSAL SERIAL BUS PORTS 0 & 1

These connectors are two four pin female sockets which are available for connecting USB device.

3.9 PARALLEL PORT CONNECTOR

This is a D-Type 25 pin female connector.

3.10 SERIAL PORT COM1, COM2

This is a D-Type 9 pin male connector for pointing devices or other serial devices.

CHAPTER 4

AMI BIOS SETUP

4.1 STARTING AMIBIOS SETUP

As POST executes, press to run AMIBIOS Setup. After that the user can enter the AMIBIOS Setup Program's Main Menu.

4.2 AMIBIOS SETUP MAIN MENU

1. The AMIBIOS Setup main menu, shown below.

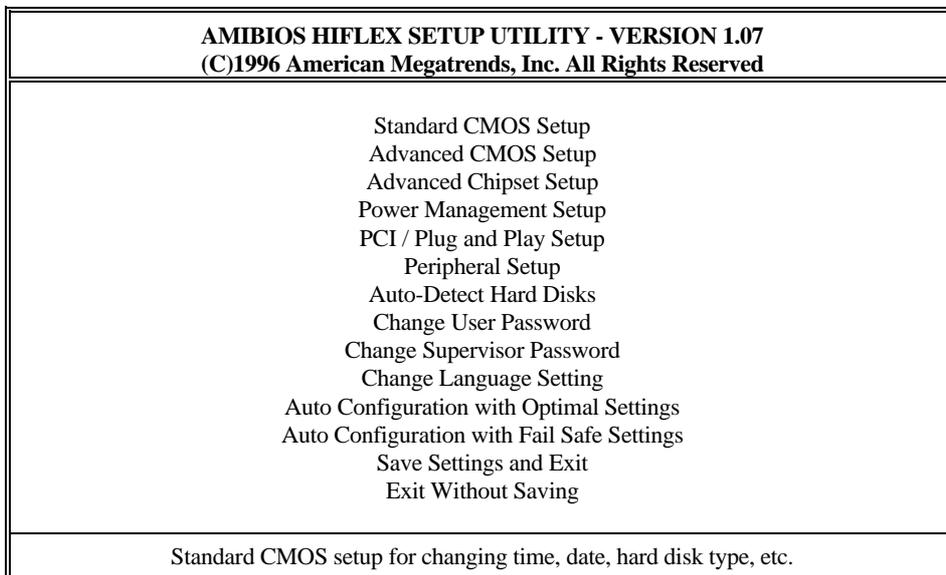


Fig. 12

Chapter 4

2. Choose an option and press <Enter>, modify the system parameters to reflect the options installed in the system (seeing the following sections for more information).
3. Press <ESC> at anytime to return to the Main Menu.
4. In the Main Menu, choose <Save Settings and Exit> to save change and reboot the system. Choosing <Exit Without Saving> to ignore all changes and exits the program.

4.3 STANDARD CMOS SETUP

AMIBIOS SET - STANDARD CMOS SETUP			
(C)1996 American Megatrends, Inc. All Rights Reserved			
Date (mm/dd/yy):	Sat Feb 01, 1997	Base Memory	:
Time (hh/mm/ss):	13:19:51	Extd Memory	640KB
			: 63MB
Floppy Drive A:	1.44MB, 3p		
Floppy Drive B:	Not Installed		
		LBA BLK PIO	32Bit
	Type	Size Cyln Head WPcom Sec	Mode Mode Mode Mode
Pri Master:	Auto		
Pri Slave:	Not Installed		
Sec Master:	Not Installed		
Sec Slave:	Not Installed		
Boot Sector Virus Protection	Disabled		
Month:	Jan - Dec	ESC: Exit	↑↓: Sel
Day:	01 - 31	PgUP/PgDn:	Modify
Year:	1901 - 2099	F2/F3:	Color

Fig. 13 Standard CMOS Setup Menu

Date(mm/dd/yy)	Type the current date.
Time(hh:mm:ss)	Type the current time.
Drive A&B	Choose 360K, 5.25in.; 1.2M, 5.25in.; 720K, 3.5in.; 1.44M, 3.5in.; 2.88MB 3.5in. or None
Hard Disks	Choose from the standard hare disk types 1 to 46. Type user is user definable. Type Auto is for auto detect the hard disk type. Type CD-ROM is for CD-ROM installed.

4.4 ADVANCED CMOS SETUP

The Advanced Setup options described in this section are the standard options as shown on the following screen. All the available options are shown at the right frame on the screen.

AMIBIOS SETUP - ADVANCED CMOS SETUP (C)1996 American Megatrends, Inc. All Rights Reserved		
1st Boot Device	: IDE-0	Available Options: Disabled Enabled
2nd Boot Device	: Floppy	
3rd Boot Device	: CDROM	
4th Boot Device	: Disabled	
Try Other Boot Device	: Yes	
S.M.A.R.T. for Hard Disks	: Disabled	
Quick Boot	: Disabled	
BootUp Num-Lock	: On	
Floppy Drive Swap	: Disabled	
Floppy Drive Seek	: Disabled	
Floppy Access Control	: Normal	
Hard Disk Access Control	: Normal	
PS/2 Mouse Support	: Enabled	
Primary Display	: VGA/EGA	
Password Check	: Setup	
Boot To OS/2	: No	
Internal Cache	: WriteBack	
External Cache	: WriteBack	
System BIOS Cacheable	: Enabled	
C000, 16K Shadow	: Disabled	ESC: Exit ↑↓: Sel
C400, 16K Shadow	: Disabled	PgUp/PgDn: Modify
C800, 16K Shadow	: Disabled	F2/F3: Color

Fig. 14 Advanced CMOS Setup Menu

1st Boot Device

This option specifies the first boot device. The settings are *Disabled*, *IDE-0*, *IDE-1*, *IDE-2*, *IDE-3*, *Floppy*, *LS-120*, *CDROM* and *SCSI*. The default setting is *IDE-0*.

2nd Boot Device

This option specifies the second boot up device. The settings are *Disabled*, *Floppy*, *LS-120* and *CDROM*. The default setting is *Floppy*.

Chapter 4

3rd Boot Device

This option specifies the third boot up device. The settings are *Disabled*, *LS-120* and *CDROM*. The default setting is *CDROM*.

4th Boot Device

This option specifies the fourth boot up device. The settings are *Disabled* and *LS-120*. The default setting is *Disabled*.

Try Other Boot Up Device

This option enable the system boot from other bootable device. The settings are *Yes* or *No*. The default setting is *Yes*.

S.M.A.R.T. for Hard Disk

This is the Self-Monitoring Analysis and Reporting Technology. The feature helps BIOS warn the user of the possible device failure thereby giving user a chance to back up the device and replace the device before actual failure happens.

Quick Boot

Set this option to *Enabled* to instruct AMIBIOS to boot quickly when the computer is powered on. The settings are:

Setting	Description
Disabled	AMIBIOS test all system memory. AMIBIOS waits up to 40 seconds for a READY signal from the IDE hare disk drive. AMIBIOS waits for .5 seconds after sending a RESET signal to the IDE drive to allow the IDE drive time to get ready again. AMIBIOS checks for a key press and runs WINBIOS Setup if the key has been pressed.
Enabled	AMIBIOS does not test system memory above 1 MB. AMIBIOS does not wait up to 40 seconds for a READY signal from the IDE hard disk drive. If a READY signal is not received immediately from the IDE drive, AMIBIOS does not configure that drive. AMIBIOS does not wait for .5 seconds after sending a RESET signal to the IDE drive to allow the IDE drive time to get ready again. You cannot run WINBIOS Setup at system boot, because there is no delay for the <i>Hit to run Setup</i> message.

Table 3

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

BootUp NumLock

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

Floppy Drive Swap

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

Floppy Drive Seek

Set this option to *Enabled* to specify that floppy drive A: will perform a seek operation at system boot. The settings are *Disabled* or *Enabled*. The Optimal and Fail-Safe default settings are *Disabled*.

Floppy Access Control

This option sets the access method of Floppy Disk. If *Normal* is chosen, a user can both read or write the floppy. If *Read-Only* is chosen, a user can read the floppy disk only.

Hard Disk Access Control

This option sets the access method of HDD. If *Normal* is chosen, a user can both read and write the HDD. If *Read-Only* is chosen, a user can read the HDD only.

PS/2 Mouse Support

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

Primary Display

This option specifies the type of display monitor and adapter in the computer. The settings are *Mono*, *CGA40x25*, *CGA80x25*, *EGA/VGA*, or *Absent*. The Optimal and Fail-Safe default settings are *EGA/VGA*.

Password Check

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

Boot to OS/2

Set this option to *Yes* to permit AMIBIOS to run with IBM OS/2. The settings are *Yes* or *No*. The default setting is *No*.

Chapter 4

Internal Cache

This option specifies the caching algorithm used for L1 internal cache memory. The settings are:

Setting	Description
<i>Disabled</i>	Neither L1 internal cache memory on the CPU or L2 secondary cache memory is enabled.
<i>WriteBack</i> (default)	Use the write-back caching algorithm.

Table 4

External Cache

This option specifies the caching algorithm used for L2 external cache memory. The settings are:

Setting	Description
<i>Disabled</i>	Neither L1 internal cache memory on the CPU or L2 secondary cache memory is enabled.
<i>WriteBack</i> (default)	Use the write-back caching algorithm.

Table 5

Optimal default setting is *Enabled*. The Fail-Safe default setting is *Disabled*.

System BIOS Cacheable

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

The settings are *Enabled* or *Disabled*. The Optimal default setting is *Enabled*. The Fail-Safe default setting is *Disabled*.

C000,16K Shadow/C400,16K Shadow/C800,16K Shadow

These options control the location of the contents of the 16KB of ROM beginning at the specified memory location. If no adaptor ROM is using the named ROM area, this area is made available to the local bus. The settings are:

Setting	Description
<i>Enabled</i>	The contents of C0000h – C2FFFh are written to the same address in system memory (RAM) for faster execution.
<i>Cached</i>	The contents of the named ROM area are written to the same address in system memory (RAM) for faster execution, if an adaptor ROM will be using the named ROM area. Also, the contents of the RAM area can be read from and written to cache memory.
<i>Disabled</i>	The video ROM is not copied to RAM. The contents of the video ROM cannot be read from or written to cache memory.

Table 6

The default setting is *Disabled*.

4.5 ADVANCED CHIPSET SETUP

The Advanced Chipset Setup options described in this section are the standard options as shown on the following screen.

AMBIOS SETUP - ADVANCED CHIPSET SETUP (C)1996 American Megatrends, Inc. All Rights Reserved		
DRAM Speed	: 70ns	Available Options: Disabled Enabled
DRAM Read Burst Timing	: x3EDO x3FPM	
Dram Write Burst Timing	: x3EDO x3FPM	
DRAM Lead Off Timing	: 10/6/4	
Memory Address Drive Strength	: 16mA, 10mA	
SDRAM CAS Latency/RAS to CAS	: 3/3	
Fast EDO Read Cycle Timing	: Disabled	
Speculative Lead Off Timing	: Enabled	
DRAM Page Idle timeout (HCLK's)	: 2	
DRAM Refresh RAS Cycles (HCLK's)	: 5	
Passive Release	: Disabled	
Delayed Transaction	: Disabled	
Host to PCI Bridge Retry	: Disabled	
Extended CPU-to-PIIX4 PHLDA#	: Disabled	
Memory Hole	: Disabled	
8bit I/O Recovery Time	: Disabled	
16bit I/O Recovery Time	: Disabled	
USB Function	: Enabled	ESC: Exit ↑↓: Sel
USB Keyboard/Mouse Legacy Support	: Disabled	PgUp/PgDn: Modify F2/F3: Color

Fig. 15 Advanced Chipset Setup Menu

DRAM Speed

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

Memory Hole

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

8-Bit I/O Recovery Time (SYSCLK)

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

16-Bit I/O Recovery Time (SYSCLK)

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

USB Function

Set this option to *Enabled* to enable the USB function. The settings are *Enabled* or *Disabled*. The default setting is *Disabled*.

USB Keyboard/Mouse Legacy Support

Set this option to *Enabled* to enable the USB keyboard/mouse. The settings are *Auto*, *Keyboard*, *Keyb+Mouse* or *Disabled*. The default setting is *Disabled*.

4.6 POWER MANAGEMENT SETUP

The Power Management Setup options described in this section are the standard options as shown on the following screen.

AMIBIOS SETUP - POWER MANAGEMENT SETUP		
(C)1996 American Megatrends, Inc. All Rights Reserved		
Power Management/APM	: Enabled	Available Options: Disabled Enabled
Soft-off by PWR-BTTN	: Delay 4 sec.	
Green PC Monitor Power State	: Standby	
Video Power Down Mode	: Standby	
Hard Disk Power Down Mode	: Disabled	
Hard Disk Time Out (Minute)	: Disabled	
Standby Time Out (Minute)	: Disabled	
Suspend Time Out (Minute)	: Disabled	
Slow Clock Ratio	: 37.5-50%	
Display Activity	: Ignore	
Serial port 1	: Monitor	
Serial port 2	: Monitor	
Parallel port	: Ignore	
Floppy disk	: Ignore	
Primary IDE 0	: Monitor	
Primary IDE 1	: Monitor	
Secondary IDE 0	: Monitor	
Secondary IDE 1	: Monitor	
		ESC: Exit ↑↓: Sel PgUp/PgDn: Modify F2/F3: Color

Fig. 16 Power Management Setup Menu

Chapter 4

Power Management/APM

Set this option to *Enabled* to enable the power management and APM (Advanced Power Management) features.

The settings are *Enabled* or *Disabled*. The default settings are *Enabled*.

Green PC Monitor Power State

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

Video Power Down Mode

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

Hard Disk Power Down Mode

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

Hard Disk Timeout (Minute)

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

Standby Timeout (Minute)

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

Suspend Timeout (Minute)

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

Slow Clock Ratio

This option specifies the speed at which the system clock runs in power saving modes. The settings are expressed as a ratio between the normal clock speed and the power down clock speed. The settings are *0-12.5%*, *12.5-25%*, *25-27.5%*, *37.5-50%*, *50-62.5%*, *62.5-75%*, *75-87.5%*.

4.7 PCI/PnP SETUP

PCI/PnP Setup options are displayed by choosing the PCI/PnP Setup Icon from the Setup Menu. The standard option is shown on the following screen.

AMIBIOS SETUP - PCI / PLUG AND PLAY SETUP (C)1996 American Megatrends, Inc. All Rights Reserved		
Plug and Play Aware O/S	: Yes	Available Options: No Yes
PCI Latency Timer (PCI Clocks)	: 32	
PCI VGA Palette Snoop	: Disabled	
PCI IDE BusMaster	: Disabled	
OffBoard PCI IDE Card	: Auto	
OffBoard PCI IDE Primary IRQ	: Disabled	
OffBoard PCI IDE Secondary IRQ	: Disabled	
Assign IRQ to PCI VGA Card	: Yes	
PCI Slot1 IRQ Priority	: Auto	
PCI Slot2 IRQ Priority	: Auto	
PCI Slot3 IRQ Priority	: Auto	
PCI Slot4 IRQ Priority	: Auto	
DMA Channel 0	: PnP	
DMA Channel 1	: PnP	
DMA Channel 3	: PnP	
DMA Channel 5	: PnP	
DMA Channel 6	: PnP	
DMA Channel 7	: PnP	ESC: Exit ↑↓ : Sel
IRQ3	: PCI/PnP	PgUp/PgDn: Modify
IRQ4	: PCI/PnP	F2/F3: Color

Fig. 17 PCI/PnP Setup Menu

Plug and Play Aware OS

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

Chapter 4

PCI Latency Timer (PCI Clocks)

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

PCI VGA Palette Snoop

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

PCI IDE BusMaster

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

OffBoard PCI IDE Card

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

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

OffBoard PCI IDE Primary IRQ

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

OffBoard PCI IDE Secondary IRQ

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

Assign IRQ to PCI VGA Card

Set this option to *Yes* if the PCI VGA used IRQs. AMIBIOS will assign an IRQ to PCI VGA adapter cards. Set this option to *No* if the PCI VGA card do not use IRQ. The settings are *Yes or No*. The Optimal and Fail-Safe default settings are *Yes*.

DMA Channel 0/1/3/5/6/7

These options specify the DMA Channels are used on. These options allow you to specify DMA Channels for use by legacy ISA adapter cards.

These options determine if AMIBIOS should remove a DMA from the pool of available DMAs passed to BIOS configurable devices. The available DMA pool is determine by reading the ESCD NVRAM. If more DMAs must be removed from the pool, the end user can use these *PnP* setup options to remove the DMA by assigning the option to the *ISA/EISA* setting. Onboard I/O is configurable by AMIBIOS. The DMAs used by onboard I/O are configured as *PnP*.

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

IRQ3/IRQ4/IRQ5/IRQ7/IRQ9/IRQ10/IRQ11/IRQ12/IRQ14/IRQ15

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

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

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

Reserved Memory Size

This option specifies the size of the memory area reserved for legacy ISA adapter cards. The settings are *Disabled*, *16K*, *32K*, or *64K*. The Optimal and Fail-Safe default settings are *Disabled*.

Reserved Memory Address

This option specifies the beginning address (in hex) of the reserved memory area. The specified ROM memory area is reserved for use by legacy ISA adapter cards. The settings are *C0000*, *C4000*, *C8000*, *CC000*, *D0000*, *D4000*, *D8000*, or *DC000*. The Optimal and Fail-Safe Default settings are *C0000*.

4.8 PERIPHERAL SETUP

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

AMIBIOS SETUP - PERIPHERAL SETUP (C)1996 American Megatrends, Inc. All Rights Reserved		
OnBoard FDC	: Auto	Available Options: Auto Disabled Enabled
OnBoard Serial Port1	: Auto	
OnBoard Serial Port2	: Auto	
Serial Port2 Mode	: Standard	
IR Transmission Mode	: N/A	
Receiver Polarity	: N/A	
Transmitter Polarity	: N/A	
OnBoard Parallel Port	: Auto	
Parallel Port Mode	: Normal	
EPP Version	: N/A	
Parallel Port IRQ	: Auto	
Parallel Port DMA Channel	: N/A	
OnBoard IDE	: Reserved	
		ESC: Exit ↑↓: Sel PgUp/PgDn: Modify F2/F3: Color

Fig. 18 Peripheral Setup Menu

Onboard FDC

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

Onboard Serial Port1

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

The settings are *3F8h*, *2F8h*, *3E8h*, *2E8h*, *Disabled* or *Auto*. The Optimal and Fail-Safe default settings are *Auto*.

Onboard Serial Port2

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

The settings are *3F8h*, *2F8h*, *3E8h*, *2E8h*, *Disabled* or *Auto*. The Optimal and Fail-Safe default settings are *Auto*.

Serial Port2 Mode

Choose Standard, IrDA and ASK IR for IrDA serial interface.

Onboard Parallel Port

This option enables the parallel port on the motherboard and specifies the parallel port base I/O port address. The settings are *378h*, *278h*, *3BCh*, *Disabled* or *Auto*.

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

Parallel Port Mode

This option specifies the parallel port mode. ECP and EPP are both bidirectional data transfer schemes that adhere to the IEEE P1284 specifications. The settings are:

Setting	Description
<i>Normal</i>	The normal parallel port mode is used. This is the default setting.
<i>EPP</i>	The parallel port can be used with devices that adhere to the Enhanced Parallel Port (EPP) specification. EPP uses the existing parallel port signals to provide asymmetric bidirectional data transfer driven by the host device.
<i>ECP</i>	The parallel port can be used with devices that adhere to the Extended Capabilities Port (ECP) specification. ECP uses the DMA protocol to achieve transfer rates of approximately 2.5 Mbs. ECP provides symmetric bidirectional communications.

Table 6

EPP Version

Choose 1.9 or 1.7.

Parallel Port IRQ

This option is only available if the setting for the Onboard Parallel Port option is a *378h*, *278h* or *3BCh*. The settings are 5 or 7.

Parallel Port DMA Channel

This option is only available if the setting for the **Parallel Port Mode** option is *ECP*. The settings are *0*, *1*, or *3*.

Onboard IDE

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

4.9 AUTO CONFIGURATION WITH OPTIMAL SETTINGS

User can load the optimal default settings for the AMIBIOS Setup options by selecting this option. The Optimal default settings are best-case values that should optimize system performance. If CMOS RAM is corrupted, the Optimal settings are loaded automatically.

4.10 AUTO CONFIGURATION WITH FAIL SAFE SETTINGS

User can load the Fail-Safe AMIBIOS Setup option settings by selecting this option from the AMIBIOS setup main menu.

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

CHAPTER 5

FLASH MEMORY UTILITY

Make sure the system is running in real mode. This utility will not operate if the system is under protected mode or virtual mode. This means that you cannot reprogram the motherboard BIOS under the Windows environment or with any memory management software, including HIMEM.SYS.

To run the utility, change to the directory containing FLASH520.EXE and BIOS file, then at the DOS Prompt, type **FLASH520 BIOSFILE.ROM <Enter>**.

The utility will load the BIOS, and the following message will shrink on the screen:

“Press “Y” to continue, “N” to Reboot”

After the “Y” is pressed, the utility will program the BIOS file to the Flash EPROM. When the process is successful, the following message appears:

“Press Any Key to Reboot”

Follow the instruction and the system will reboot with new BIOS.

APPENDIX A

QUICK GUIDE

The table below summaries the functions and settings of each jumper of the motherboard.

Function		Jumper Settings
CPU Voltage Selection	3.3V Single Voltage CPU For P54C, P54CT	JP9: 1-2 short 3-4 open JP10: short JP12: short JP13: 1-3 open 2-4 open JP14: short
	3.5V Single Voltage CPU For 54C-VRE, AMD-K5, Cyrix 6x86	JP9: 1-2 short 3-4 short JP10: short JP12: short JP13: 1-3 open 2-4 open JP14: short
	3.3V (I/O)/2.8V (core) Dual Voltage CPU For P55C, Cyrix 6x86L	JP9: 1-2 open 3-4 open JP10: open JP12: open JP13: 1-3 short 2-4 short JP14: short
	3.3V (I/O)/2.9V (core) Dual Voltage CPU For AMD-K6-PR166/PR200, Cyrix 6x86MX	JP9: 1-2 open 3-4 short JP10: open JP12: open JP13: 1-3 short 2-4 short JP14: short
	3.3V (I/O)/3.2V (core) Dual Voltage CPU For AMD-K6-PR233	JP9: 1-2 open 3-4 open JP10: open JP12: short JP13: 1-3 short 2-4 short JP14: short
CPU Speed Selection	For 90MHz Intel Pentium, AMD-K5-PR90 and AMD-K5-PR120 CPU	SW1-3: OFF SW1-4: OFF SW1-6: ON SW1-7: OFF
To be continued...		

Appendix A

Function		Jumper Settings	
CPU Speed Selection	For 100MHz and 233MHz Intel Pentium, AMD-K6-PR233, AMD-K5-PR100 and AMD-K5-PR150 CPU	SW1-3: SW1-4: SW1-6: SW1-7:	OFF OFF OFF OFF
	For 110MHz Cyrix 6x86-P133+ CPU	SW1-3: SW1-4: SW1-6: SW1-7:	ON OFF ON ON
	For 120MHz Intel Pentium, Cyrix 6x86-P150+ and Cyrix 6x86L-PR150+ CPU	SW1-3: SW1-4: SW1-6: SW1-7:	ON OFF ON OFF
	For 133MHz Intel Pentium, AMD-K5-PR133 (REV C), Cyrix 6x86-P166+ and Cyrix 6x86L-PR166+ CPU	SW1-3: SW1-4: SW1-6: SW1-7:	ON OFF OFF OFF
	For 150MHz Intel Pentium CPU	SW1-3: SW1-4: SW1-6: SW1-7:	ON ON ON OFF
	For 150MHz Cyrix 6x86-PR200+, Cyrix 6x86L-P200 and Cyrix 6x86MX-PR200 CPU	SW1-3: SW1-4: SW1-6: SW1-7:	ON OFF OFF ON
	For 166MHz Intel Pentium, AMD-K6-PR166 and AMD-K5-PR166 CPU	SW1-3: SW1-4: SW1-6: SW1-7:	ON ON OFF OFF
	For 188MHz Cyrix 6x86MX-PR233 CPU	SW1-3: SW1-4: SW1-6: SW1-7:	ON ON OFF ON
	For 200MHz Intel Pentium and AMD-K6-PR200 CPU	SW1-3: SW1-4: SW1-6: SW1-7:	OFF ON OFF OFF
System ROM Selection	5V Flash EPROM	JP3:	2-3 short
	12V Flash EPROM	JP3:	1-2 short
Ring In Selection	COM1	JP11:	1-2 short
	COM2	JP11:	2-3 short