PREFACE

Thank you for purchasing the 486PI system board. This document will aid you to configure and to install this system board properly.

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CHAPTER 1: INTRODUCTION

The 486PI system board adds to our product line a highly integrated and cost effective solution, without compromising performance or quality. All Intel 486 CPUs are supported on the 486PI system board. With top CPU speed at 100MHz and integrated Write-Back cache, the 486PI dramatically boosts system throughput for even the most demanding applications.

PROCESSOR   3.3-Volt 486DX4.
                        5.0-Volt 486DX2, 486DX, 486SX, 487SX, P24T.

BUS SLOTS   Five ISA slots.
                        Three 32-bit PCI slots.
                        Two 32-bit VL-Bus slots
                        All VL and PCI bus slots support Bus Master mode.

CACHE MEMORY   512KB, 256KB, or 128KB Write Back cache.

SYSTEM MEMORY   Four 72-pin SIMM sockets support up to 128MB. Supports 512Kx36, 1Mx36, 2Mx36, 4Mx36, 8Mx36 SIMM modules.
                        70ns or faster DRAM speeds.

CHIPSET   Intel ARIES EPA Green 82420EX PCI Chipset. Sophisticated System Power Management.
                        Supports Level 1 Write-Back CPU.

BIOS   AMI BIOS with ISA Plug & Play support. Supports optional FLASH BIOS.

ON-BOARD IDE   32-bit PCI IDE supports Mode 3 Timing. Auto-configuring.

INTEGRATED I/O   2.88 MB Floppy Controller supports up to four floppy drives.
                        Two RS-232C 16550-compatible Serial ports.
                        One ECP/EPP Bi-directional Parallel port.
                        Cables included.

BOARD SIZE   Baby AT.

TYPICAL POWER   +5V   Tolerance 5%, current 4.5 Amperes.
                    +12V   Tolerance 10%, current 100 mA.
                    -5V   Tolerance 5%, current 150 mA.
                    -12V   Tolerance 10%, current 100 mA.

ENVIRONMENT   Operating Temperature   0C to +55C.
                    Storage Temperature   -40C to +70C.
                    Relative Humidity   92% RH at 36C.
                    Airflow Requirements   100LFM with on-board
                                                              fan.

CHAPTER 2: JUMPERS & CONNECTORS

When working with the 486PI, it is extremely important that you avoid static electricity. Always ground yourself by wearing a wrist or ankle strap.

Figures 1 on the next page shows the component layout of the 486PI system board with locations of the system board jumpers and connectors. Note that most of the jumpers and the connectors on the system board are labeled with proper names, with pin 1 marked as "1". To avoid damaging the board and to have proper operation, caution should be taken when connecting these components.

SYSTEM BOARD JUMPERS

Jumpers are used to select between various operating modes. A jumper switch consists of two, three, or four gold pins projecting from the system board. Placing the plastic jumper cap over two pins connects those pins and makes a particular selection. Using the cap to cover two pins in this way is referred to as shorting those pins. If the cap is not placed on any pins at all, this is referred to as leaving the pins open.

Note: When you open a jumper, leave the plastic jumper cap attached to one of the pins so you don't lose it.

OPEN   SHORTED
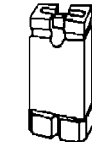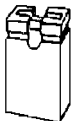
PINS 1-2
SHORTED

2-pin jumper   3-pin jumper
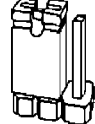
Figure 1: 486PI Component Layout

External Battery Connector

Three 32-bit PCI local bus slots

Holes for Plastic mountings or screws

CMOS Discharge Jumper JP1

Battery

Keyboard Connector

Power Connectors

Four 72-Pin SIMM socket support up to 128 Mbytes

Five 16-bit ISA slots

FLP 2

FLP 1

S I M M

S I M M

S I M M

S I M M

PR L

4   3   2   1

IDE

Green PC Selection Jumper Green

GREEN

Parallel Port IRQ Selection Jumper JP3

JP2 JP3

Intel Aries S82420EX

Parallel ECP Port Selection Jumper JP4

Moniter Selection Jumper JP5

JP5

SMC FDC37C6650F

SRL2

SRL1

Keyboard Controller

JP7 JP6

UMC UM82C865F

Two 32-bit VESA standard local bus mastering slots

Intel Aries S82420EX

BIOS

JP11 JP9

Cache Size Jumpers JP8, JP9, JP10, JP11 & JP12

JP10 JP8
JP12

SIMM Type Jumpers JP15 & JP16

JP16 JP15

Cache Memory up to 512 KB

CPU Clock Speed Selection Jumpers JP19, JP20, JP21, & JP22

JP21 JP20 JP19

CPU

TBLE

HDLED

JP22

Turbo

JP25

KLOCK SPKR Reset

Turbo Enable Jumper TURBO

CPU Type Selection Jumpers JP25

CPU Type Jumper

CPU Type	JP25
486DX4, DX2, DX, P24D, P24T, 487SX	1-2
486SX	2-3

CPU External Frequency Jumpers

If you are installing an i486DX or i486SX, the internal CPU clock speed is the same as the external CPU clock speed. This is different for i486DX2 CPU where the external speed is one-half of the internal speed. For example, a 486DX2-66 has an external clock speed of 33MHz.

Frequency	CPU supported	JP19	JP20	JP21	JP22
33 MHz	486SX-33 487SX-33 486DX-33 486DX2-66 486DX4 P24T	Open	Short	Short	1-2
25 MHz	486SX-25 487SX-25 486DX-25 486DX2-50	Short	Open	Open	2-3

Cache Size Jumpers

Cache Size	JP8	JP9	JP10	JP11	JP12
128 KB	SHORT	OPEN	OPEN	OPEN	OPEN
256 KB	OPEN	SHORT	SHORT	SHORT	OPEN
512 KB	SHORT	OPEN	OPEN	SHORT	SHORT

For 128KB cache, install four 32Kx8-15 SRAM chips at U29, U34, U36, U39.

For 256KB cache, install eight 32Kx8-15 SRAM chips at U29, U34, U36, U39, U30, U35, U37, U40.

For 512KB cache, install four 128Kx8-15 SRAM chips at U29, U34, U36, U39.

Clear CMOS Data Jumper

The CMOS jumper JP1 is used to clear the system configuration data currently stored in the CMOS RAM. This function would be useful if you were to forget the user password for the system.

All system setup information (hard disk type, date/time, etc...), stored in the CMOS, will be destroyed. Use this function cautiously.

Function	JP1
Normal CMOS Operation	1-2 (Default)
Clear CMOS Data	2-3

GREEN PC Jumper

Function	GREEN
Normal system operation, power saving mode is triggered by system timer. (Auto Green)	OPEN (Default)
Force system to go into power saving mode. (Forced Green)	SHORT

TURBO Jumper

Function	TURBO
Enable TURBO mode.	SHORT (Default)
Disable TURBO mode.	OPEN

Turbo LED Jumper

The Turbo LED jumper, marked as "TBLED", is a 2-pin BERG strip. It is used to connect a CPU operating frequency indicator LED from the front panel to the system board. The pin assignments are indicated below:

Pin	Description
1	LED Cathode (-)

2	LED Anode (+)

Harddisk Activity LED Jumper

The hard disk activity LED jumper (labeled as "HDLED") is a 2-pin keyed BERG strip. It is used to connect to front panel hard disk LED.

Pin	Description
1	LED Anode (+)
2	LED Cathode (-)

Parallel Port Jumper

Parallel Port	JP3
Select interrupt line IRQ7 for Parallel port.	1-2 (Default)
Select interrupt line IRQ5 for Parallel port.	2-3

JP4	JP6	JP7	Enable 4 FLOPPY Drives	Enable ECP Mode*
OPEN	OPEN	1-2	Yes (default)	No
1-2	1-2	2-3	No	Yes, use DMA 3
2-3	2-3	2-3	No	Yes, use DMA 1

*Extended Communication Port

Remark: When ECP Bi-directional paralled port is used, the "4 Floppy Drives" option must be disabled.

Display Type Jumper

Display Type	JP5
Video display is VGA, EGA, or Monochrome.	OPEN (Default)
Video display is CGA.	SHORT

<u>Factory Reserved Jumpers</u>

Jumpers Location	Position
JP18, JP24, JP27, JP29, JP30	Open
JP17, JP26	Short
JP2, JP13, JP14, JP28	1-2
JP23	2-3

Remark: **The above jumper setting are factory installed. Any modification to these jumpers will void your factory warranty.**

SYSTEM BOARD CONNECTORS

Power Supply Connectors

The two Power Supply connectors are 6-pin AT standard power
connectors. Most power supplies have two six-wire connectors, two of
the wires on each connector are black. Align the two six-wire connectors
so that the two black wires on each connector are in the middle as shown
below.

Black
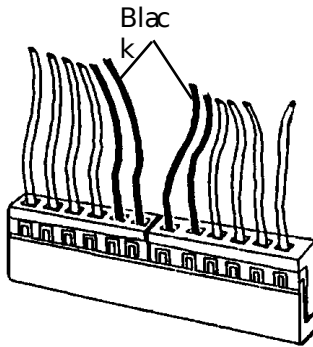
Pin	Connector PS2	Connector PS1
1	Power Good	Ground
2	+5 VDC	Ground
3	+12 VDC	-5 VDC
4	-12 VDC	+5 VDC
5	Ground	+5 VDC
6	Ground	+5 VDC

Keyboard Connector

The keyboard connector is a 5-pin, circular-type DIN socket. It is used to connect the system board keyboard interface to any standard AT-compatible keyboard (84 or 101 -key type keyboards).   The pin assignments are listed below:

Pin	Description
1	Keyboard Clock Signal
2	Keyboard Data Signal
3	Not Used
4	Ground
5	+5V Fused VDC

Power LED and Keyboard Lock Connector

The Power LED and Keyboard Lock connector (KLOCK) is 5-pin keyed BERG strip. It is used to connect +5 VDC power to the power indicator LED at the front panel and connect security keyboard lock to the keyboard controller. This allows you to switch off the keyboard and so provide limited security against casual intruders. The pin assignments are indicated below:

Pin	Description
1	LED Power
2	Key (No Connection)
3	Ground
4	Keyboard Lock
5	Ground

Speaker Connector

The Speaker connector (SPKR) is a 4-pin keyed BERG strip. It is used to connect an external 2-inch, 8-ohm speaker to the system board to provide sound capability. The pin assignments are defined below:

Pin	Description
1	Speaker Data Out
2	Key (No Connection)
3	Ground
4	+5 VDC

Speaker Connection
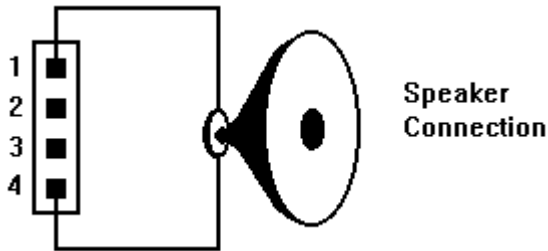
Reset Connector

The system RESET connector (RESET) is a 2-pin BERG strip. It is used to connect the push button reset switch located on the front panel to the system board. System reset can be done by shorting pin 1 to pin 2 with the same effect as turning the power off and then on again.

Pin	Description
1	Ground
2	Reset Input

Parallel Port Connector

The on-board parallel port connector (PARALL) is a 2x13-pin male header connector. The pin assignment is shown below:

Pin	Description	Pin	Description
1	-STROBE	14	-AUTO FEED XT
2	Data Bit 0	15	-ERROR
3	Data Bit 1	16	-INIT
4	Data Bit 2	17	-SLCT IN
5	Data Bit 3	18	Ground
6	Data Bit 4	19	Ground
7	Data Bit 5	20	Ground
8	Data Bit 6	21	Ground
9	Data Bit 7	22	Ground
10	-ACK	23	Ground
11	-BUSY	24	Ground
12	PE	25	Ground
13	SLCT	26	No Connection

The parallel port can be disabled through the BIOS (see chapter 4: BIOS setup.)

Serial Port 1 & 2 Connectors

The serial port 1 and 2 connectors are the 2x5-pin male headers SRL1 and SRL2. Users should use a flex cable with a 9 or 25 -pin male D-subminiature receptacle at one end and a 2x5-pin female header at the other end to provide RS-232 serial interface.

Pin	Description	Pin	Description
1	Carrier Detect (RLSD)	6	Receive Data (RXD)
2	Transmit Data (TXD)	7	Data Terminal Ready (DTR)
3	Signal Ground	8	Data Set Ready (DSR)
4	Request To Send (RTS)	9	Clear To Send (CTS)
5	Ring Indicator (RI)	10	No Connection

The serial ports can be disabled through the BIOS (see chapter 4: BIOS setup.)

Floppy Interface Connectors

The on-board Floppy Interface connectors (FLP1 and FLP2) are 2x17-pin male headers. This interface supports two 5.25" or 3.5" floppy drives per connector in any combination and also can be disabled, through the BIOS (see chapter 4: BIOS Setup,) if no floppy drives are present on the system.

Pin	Description	Pin	Description
2	RPM	1	Ground
4	No Connection	3	Ground
6	No Connection	5	Ground
8	Index	7	Ground
10	Motor 1	9	Ground
12	Drive 2	11	Ground
14	Drive 1	13	Ground
16	Motor 2	15	Ground
18	Direction	17	Ground
20	Step	19	Ground
22	Write Data	21	Ground
24	Write Enable	23	Ground
26	Track0	25	Ground
28	Write Protect	27	Ground
30	Read Data	29	Ground
32	Head Select	31	Ground
34	Disk Change	33	Ground

IDE Interface Connector

The on-board IDE Interface connector (IDE) is a 2x20-pin male header. This interface supports up to two hard disk drives on the system. This interface can also be disabled, through the BIOS (see Chapter 4: BIOS Setup,) in the event that no hard drive is present or a separate hard drive controller is installed on the system.

Pin	Description	Pin	Description
2	Ground	1	IDE Reset/
4	Data 8	3	Data 7
6	Data 9	5	Data 6
8	Data 10	7	Data 5
10	Data 11	9	Data 4
12	Data 12	11	Data 3

14	Data 13	13	Data 2
16	Data 14	15	Data 1
18	Data 15	17	Data 0
20	No Connection	19	Ground
22	Ground	21	No Connection
24	Ground	23	I/O Write/
26	Ground	25	I/O Read/
28	ALE	27	No Connection
30	Ground	29	No Connection
32	IOCS16/	31	IDE IRQ 14
34	No Connection	33	Address A1
36	Address A2	35	Address A0
38	IDE Chip Select 1/	37	IDE Chip Select 0/
40	Ground	39	IDE Active/

CHAPTER 3: HARDWARE INSTALLATION

CPU INSTALLATION

Care should be taken when installing the CPU into the Pin Grid Array (PGA) socket on the system board. Make certain that pin 1 of the CPU chip is correctly aligned with pin 1 of CPU socket. ZIF socket and CPU are shown below.

Pin 1

Pin No. 1

CPU
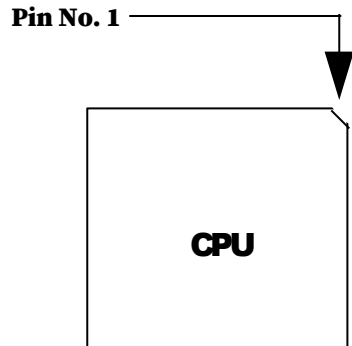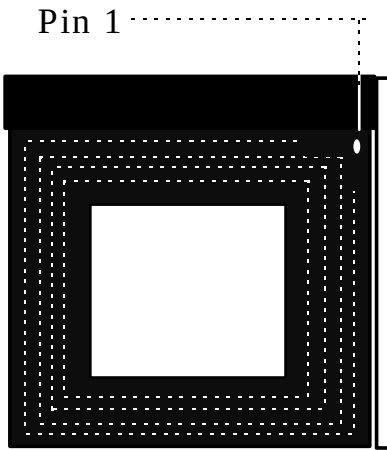
SYSTEM MEMORY

The on-board DRAM memory subsystem has four module mounting sockets which are divided into "banks" of one socket each. They support 256Kx36, 512Kx36, 1Mx36, 2Mx36, 4Mx36, 8Mx36, and 16Mx36 DRAM SIMMs.   DRAM speed must be 70ns or faster. You can configure the memory of the 486PI in a variety of ways as shown below.

SIMM1	SIMM2	SIMM3	SIMM4
1Mx36	1Mx36 4Mx36 16Mx36		
1Mx36	1Mx36 4Mx36 16Mx36	1Mx36 4Mx36	
1Mx36	1Mx36 4Mx36 16Mx36	1Mx36 4Mx36	1Mx36 4Mx36
2Mx36			
2Mx36	2Mx36 8Mx36		
2Mx36	1Mx36 4Mx36 16Mx36		
2Mx36	1Mx36 4Mx36 16Mx36		1Mx36 4Mx36
4Mx36	4Mx36 16Mx36		
4Mx36	4Mx36 16Mx36	4Mx36	
4Mx36	4Mx36 16Mx36	4Mx36	4Mx36
8Mx36			
8Mx36	8Mx36		
8Mx36	1Mx36 4Mx36 16Mx36		
8Mx36	1Mx36 4Mx36 16Mx36		1Mx36 4Mx36
16Mx36			
16Mx36	16Mx36		

Installing DRAM SIMMs

STOP

When working with DRAM SIMMs, it is extremely important that you avoid static electricity. Always ground yourself by wearing a wrist or ankle strap.

1. The SIMM module should face to the right with pin 72 next to the power supply connectors.

2. Insert the SIMM at a 45 degree angle, tilted towards ISA slots.

3. Gently push the SIMM to an upright position until it "snaps" into place.

4. Repeat above steps until the entire bank is filled.
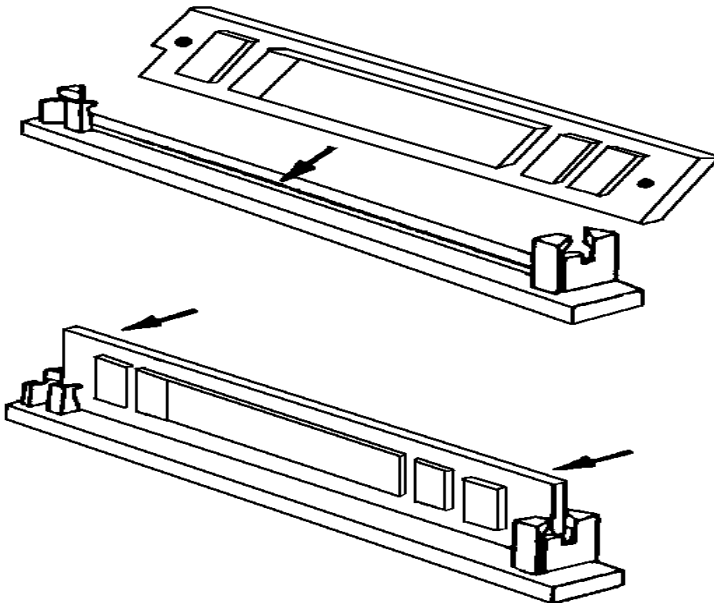
INSTALLING A VL-BUS CARD

Carefully follow these steps to install a VL-Bus card:

1. Turn off your computer and unplug the power cord.

2. Turn off the power to all peripheral devices, such as your printer.

3. Disconnect the cables from the back of the system in order to give more room to work. Note how all cables are connected prior to disconnection.

4. Remove the computer's cover.

5. Choose an unused VL-Bus slot.

6. Setting the VL-Bus card according to its user's manual.

7. Holding the card at the center of the top edge, gently push straight down with equal pressure at both ends.

8. Replace the screw to hold the card into place.

9. Replace and secure the system cover.

10. Reconnect all the wires and cables.

NOTCH   PIN

VL-BUS SLOT   **AT SLOT**
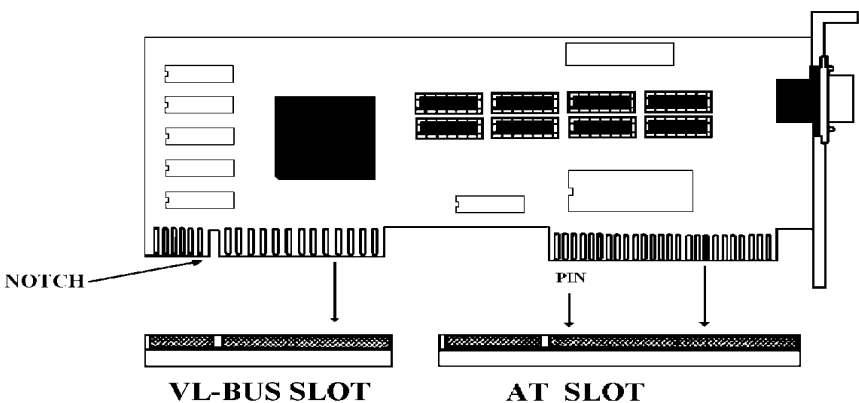
EQUIPMENT REQUIRED

The dimension of the 486PI system board is designed to fit perfectly in a PC/XT (or PC/AT) standard case. To build a complete high performance system based on the 486PI system board, the following equipment are needed:

A chassis with dimension similar to PC/XT/AT standard chassis.

A standard AT 220W power supply which is capable to provide a continuous power within a +4.85 VDC to +5.25 VDC range. A power line filter may be needed for areas with noisy transmission.

A 2-inch, 8-Ohm speaker to provide sound capability.

A 2-position switch with a 2-pin connector for speed function.

A push button switch with 2-pin connector for reset function.

One floppy drive (360K or 1.2M or 1.44M).

Hard disk drive.

A set of flat cables for floppy drive and hard disk drive.

A VL-Bus video card (Monochrome, CGA, EGA, VGA).

A set of flat cables for floppy drive and hard disk drive.

An AT-compatible keyboard (84 or 101 Keyboard) with cable.

A video display monitor.

Following additional equipment will be useful to enhance the system:

A bus or serial mouse.

A tape back up drive.

CHAPTER 4: BIOS SETUP

You need to setup a system whenever:

- You start a new and unconfigured system.
- You receive a start-up error message indicating the configuration information stored in the non-volatile CMOS RAM has somehow become corrupted.
- You add, remove or change peripherals from your system.

The first time you power up the system, the configuration information stored in the battery-backed CMOS RAM may not be correct. The BIOS detects this condition and prompts user to go through the SETUP section. This chapter explains how to use the BIOS SETUP program and make the appropriate entries.

STOP

Some of the parameters are already factory preset and do not need to be changed. Please read the instructions carefully and only change the settings if necessary.

ENTERING SETUP

1. Reset the system by turning it OFF then ON or pushing the "RESET" button on the system front panel.

2. Hit the **<Del>** key momentarily as soon as the following message appears: **"Hit <DEL>, if you want to run SETUP"**

3. After you press the <**Del**> key, the following BIOS Setup windows appear:

   Setup: Standard, Advanced CMOS, Advanced Chipset, Power Management, and Peripheral.

   Utility: Detect Master, Detect Slave, and Color Set.

   Security: Password and Anti-Virus.

Default: Original, Optimal, and Fail-Safe settings.

SETUP WINDOW

Types of Setup	Description
Standard	Set time date, hard disk type, and types of floppy drives.
Advanced	External Cache, Internal Cache, System Boot Up Sequence, and many others.
Power Management Setup	Control power conservation options.
Peripheral	Control on-board Floppy, Serial and Parallel ports.

Standard CMOS Setup

Use the standard CMOS Setup screen to check or modify general configuration information such as the date, time, floppy type, and hard disk type.

- **Date** (Month/Date/Year):   You manually set the electronic calendar only if the values are incorrect.

- **Time** (Hour/Minute/Second): The time here is 24-hour time.   You would enter 5:30 P.M. as 17:30:00.

- **Floppy Drive A: Type** (360KB, 720KB, 1.2MB, 1.44MB, 2.88MB, or Not Installed):   Specify the type of the first floppy drive installed on the system.   "Not Installed" could be used as an option for diskless workstations.

- **Floppy Drive B: Type**:   Specify the type of the second floppy drive installed on the system.

- **Hard Disk Master, Slave Type**:   The BIOS provides 46 pre-defined types of popular hard disk drives.   Relevant specifications include the number of cylinders and heads, write pre-compensation time, read/write head landing zone, number of sectors per track.   A hard disk will not work properly if your enter incorrect drive parameters.

  If your particular drive is not one of the 46 pre-defined types, simply scroll down to select type 47 and enter the appropriate values for **cylinders**, **heads**, **WPcom**, **LZone**, and **sectors**.   **Size** is

automatically determined by the other entries. You can also let the BIOS to determine the drive type by selecting "**Detect Master, Detect Slave**" from the Utility Window.

Parameter	Description
Type	The number for a drive with certain identification parameters.
Cylinders	The number of cylinders in the disk drive.
Heads	The number of heads.
Write Precompensation	The size of a sector gets progressively smaller as the track diameter diminishes. Yet each sector must still hold 512 bytes. Write precompensation circuitry on the hard disk compensates for the physical difference in sector size by boosting the write current for sectors on inner tracks. This parameter is the track number where write precompensation begins.
Landing Zone	This number is the cylinder location where the heads will normally park when the system is shut down.
Sectors	The number of sectors per track. MFM drives have 17 sectors per track. RLL drives have 26 sectors per track. ESDI drives have 34 sectors per track. SCSI and IDE drive may have even more sectors per track.
Capacity	The formatted capacity of the drive is (Number Of heads) x (Number of cylinders) x (Number of sectors per track) x (512 bytes per sector)

Advanced CMOS Setup

- **System Boot Up NumLock**: When the computer boots, it selects the numeric values rather than the cursor control functions for the numeric keypad on IBM compatible keyboards. Most extended compatible keyboards have separate cursor control keys. It is therefore unnecessary to use the numeric keypad for this. The default setting is "On".

- **System Boot-Up Sequence**: If "A:, C:", the BIOS will look for bootable operating system files from floppy drive A: first before looking for them in drive C:. You can reverse this sequence by selecting "C:, A:" (default).
- **External Cache Memory**: Select "Enabled" to enable external on-board cache memory.

- **Internal Cache Memory**: Select "Enabled" to enable the cache memory inside the CPU chip.

- **Password Checking Option**: The options are "Setup" or "Always". The default setting is "Setup". The password feature can be used to prevent unauthorized system boot-up or unauthorized use of BIOS SETUP.

    "Always"   Each time the system is turned on, the password prompt appears.

    "Setup"   If there is a password set, the Password prompt only appears if you attempt to enter the BIOS Setup program. If there is no set password, the Password Checking Option is disabled. You create a password by using "PASSWORD" option in the SECURITY WINDOW.

- **Video Shadow C000 & C400, 32K**: Shadowing helps to speed up BIOS access by copying BIOS code to fast 32-bit RAM area and executes it from there. The default setting is "Enabled".

- **Adapter ROM Shadow**: Default setting is "Disabled". If you have other expansion cards with ROMs on them such as SCSI controller, you will need to know which addresses the ROMs use.

- Set **LBA Primary Controller**: Select "Enabled" for IDE hard disk that supports LBA mode for larger than 512KB capacity.

- **IDE Block Mode**: Some latest IDE hard disks support multiple sector (Block Mode) transfer for faster performance. Users select "Enabled" to take advantage of this feature. If your system hard disk supports Block Mode, BIOS message "Block Mode Enabled" will appear during boot-up.

Power Management Setup

The Power Management Setup provides a programming way to stop CPU clock and put other system devices such as Video Monitor into power saving mode.

- **Advanced Power Management** : Select "Enabled" to enable system power management.

- **IDE Drive Power Down**:   If this option is enabled, the IDE hard disk will go into Standby Mode to save power after a number of preset minutes (Timeout Value) of no access.

- **VESA Video Power Down**:   If this option is enabled, the Video screen will go off to save power after a number of preset minutes (Timeout Value) of no access.

- **Timeout Value**: Select the number of minutes.

- **Interrupt (IRQ) Break Event**: This is the system events or activities monitoring. If the power management is enabled, the system will go into power saving mode after all the events have been idle for a pre-defined time shown on the "Timeout Value". Any detected event will wake up the system immediately and the timer is reset to zero. Each of these events can be controlled (enabled or disabled) individually.

IRQ3	Monitoring the COM2 activities
IRQ4	Monitoring the COM1 activities
IRQ5	Monitoring the LPT2 activities
IRQ6	Monitoring the Floppy activities
IRQ7	Monitoring the LPT1 activities
IRQ8	Monitoring the Real-Time-Clock activities
IRQ9	Monitoring interrupt IRQ9
IRQ10	Monitoring interrupt IRQ10
IRQ11	Monitoring interrupt IRQ11
IRQ12	Monitoring interrupt IRQ12
IRQ14	Monitoring IDE hard disk activities
IRQ15	Monitoring interrupt IRQ15

Peripheral Management Setup

- **Programming Mode**: Normally select "Auto" so all of the selections below will assume their default values.

- **On-Board Floppy Controller**: User should only select "Disabled" for a diskless workstation or when an external floppy controller card is present. Default is "Enabled".

- **Serial Port 1**:   Select an appropriate address as shown below. Select 'Disabled' if an external serial port adapter is present with the same address. Default is "3F8" (refer to Appendix D: AT I/O Address Map.)

  COM1: **3F8** (default)
  COM3: 3E8

- *Serial Port 2*:   Select an appropriate address as shown below. Select "Disabled" if an external serial port adapter is present with the same address. Default is "2F8" (refer to Appendix D: AT I/O Address Map.)

  COM2: **2F8** (default)
  COM4: 2E8

- *Parallel Port*:   Select an appropriate address as shown below. Select "Disabled" if an external Parallel port adapter is present with the same address (refer to Appendix D: AT I/O Address Map.)

  378 (default)
  278
  3BC

- *Parallel Port Mode*:   Select "**Normal**" for IBM Compatible Bi-directional Parallel Port. Select "**Extended**" to enable Microsoft and Hewlett Packard Extended Capabilities Port (ECP) IEEE 1284 Compliant.

UTILITY WINDOW

Detect Master

This utility detects parameters for IDE drive hardware configured as first drive (master) in dual drive system or the only drive in system. It is not guaranteed that this utility will work with all IDE hard disk. There is no need to use this utility if you already have hard disk type information.

Detect Slave

This utility detects parameters for IDE drive hardware configured as second drive (slave) in dual drive system. It is not guaranteed that this utility will work with all IDE hard disk. There is no need to use this utility if you already have hard disk type information.

Color Set

This utility allows to select color sets for AMIBIOS setup screens.

SECURITY WINDOW

Password

Allows to set password user will be asked to enter before entering into AMIBIOS setup

Anti-Virus

When virus protection is enabled system will warn every time any program tries to write boot sector.

DEFAULT WINDOW

The Default Setup windows has following options. Every option in BIOS Setup contains two default values: a Fail-Safe default and the Optimal default value.

Original Defaults

Restores old values of setup if user decides to abandon changes.

Optimal Defaults

The Optimal default values provide optimum performance settings for all devices and system features.

Fail-Safe Defaults

The Fail-Safe default settings consist of the safest set of parameters. Use them if the system is behaving erratically. They should always work but do not provide optimal system performance characteristics.

CHAPTER 5: SOFTWARE DRIVERS

FLASH BIOS Programming

FLASH BIOS is an optional feature, please contact our sale representatives for details.

Follow these steps to reprogram Flash BIOS:

1. Run BIOS Setup by pressing "Del" key as soon as the display appears after system is reset.

2. Select "Advanced" icon in the "Setup" window and change option "External Cache" to "Disabled".

3. Reboot the system and run AMIFLASH.COM program from the Driver Diskette. Follow the screen instructions.

4. Repeat steps 1 and 2 but this time change option "External Cache" back to "Enabled".

Four-Floppy Driver

In the DOS/Windows environment, you only need to install the software driver for machine to support up to 4 Floppy drives.

Follow these steps to install the driver:

1. Insert the driver disk into floppy drive A: and type:

   CD A:
   INSTALL

2. Follow the screen instructions.

For manual installation, please see README.TXT file.

APPENDIX A: KEYBOARD HOT KEYS

SYSTEM SPEED

System speed can also be changed through keyboard. There are two available speeds as shown below:

Turbo speed: Cache memory and 32-bit DRAM transfer mode are ON. Set by pressing <**+**> key once while holding <**Ctrl**>, <**Alt**>, and <**Shift**> keys.
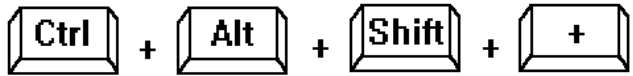
Slow speed: Cache memory and 32-bit DRAM transfer mode are OFF.   Set by pressing <**-**> key once while holding <**Ctrl**>, <**Alt**>, and <**Shift**> keys.

APPENDIX B: AMI BIOS HARD DISK TYPE

Type	Cylinder	Heads	Write Precomp	Landing Zone	Sectors	Size
1	306	4	128	305	17	10MB
2	615	4	300	615	17	20MB
3	615	6	300	615	17	31MB
4	940	8	512	940	17	62MB
5	940	6	512	940	17	47MB
6	615	4	65535	615	17	20MB
7	462	8	256	511	17	31MB
8	733	5	65535	733	17	30MB
9	900	15	65535	901	17	112MB
10	820	3	65535	820	17	20MB
11	855	5	65535	855	17	35MB
12	855	7	65535	855	17	50MB
13	306	8	128	319	17	20MB
14	733	7	65535	733	17	43MB
16	612	4	0	663	17	20MB
17	977	5	300	977	17	41MB
18	977	7	65535	977	17	57MB
19	1024	7	512	1023	17	60MB
20	733	5	300	732	17	30MB
21	733	7	300	732	17	43MB
22	733	5	300	733	17	30MB
23	306	4	0	336	17	10MB
24	925	7	0	925	17	54MB
25	925	9	65535	925	17	69MB
26	754	7	754	754	17	44MB
27	754	11	65535	754	17	69MB
28	699	7	256	699	17	41MB
29	823	10	65535	823	17	68MB
30	918	7	918	918	17	53MB
31	1024	11	65535	1024	17	94MB
32	1024	15	65535	1024	17	128MB
33	1024	5	1024	1024	17	43MB
34	612	2	128	612	17	10MB
35	1024	9	65535	1024	17	77MB
36	1024	8	512	1024	17	68MB
37	615	8	128	615	17	41MB
38	987	3	987	987	17	25MB
39	987	7	987	987	17	57MB
40	820	6	820	820	17	41MB
41	977	5	977	977	17	41MB
42	981	5	981	981	17	41MB
43	830	7	512	830	17	48MB
44	830	10	65535	830	17	69MB
45	917	15	65535	918	17	114MB

46	1224	15	65535	1223	17	152MB
47	USER'S	TYPE				

APPENDIX C: MEMORY MAPPING

Address (hex)	Function	Comments
00000000-0007FFFF	512K System RAM	Cached
00080000-0009FFFF	128K System RAM	Cached
000A0000-000BFFFF	128K Video RAM	Not Cached
000C0000-000C7FFF	32K Video BIOS	Cached
000C8000-000CFFFF	32K I/O ROM	Not Cached
000D0000-000DFFFF	64K I/O ROM	Not Cached
000E0000-000EFFFF	64K Extended BIOS	Not Cached
000F0000-000FFFFF	64K On-Board BIOS ROM	Cached
00100000-00BFFFFF	System Memory (RAM)	Cached
00C00000-00FFFFFF	System Memory (RAM)	Cached
01000000-BFFFFFFF	System Memory (RAM)	Cached
C0000000-C1FFFFFF	System Memory (RAM)	Cached
C2000000-FFFDFFFF	System Memory	Cached
FFFE0000-FFFFFFFF	128K On-Board BIOS ROM	Not cached

APPENDIX D: AT I/O ADDRESS MAP

I/O ADDRESS (HEX)	I/O DEVICE
000 - 01F	DMA Controller 1, 8237A-5
020 - 03F	Interrupt Controller 1, 8259A
040 - 05F	System Timer, 8254-2
060 - 06F	8742 Keyboard Controller
070 - 07F	Real-Time Clock/CMOS and NMI Mask
080 - 09F	DMA Page Register, 74LS612
0A0 - 0BF	Interrupt Controller 2, 8259A
0C0 - 0DF	DMA Controller 2, 8237A-5
0F0 - 0FF	CPU's Internal Math Coprocessor
1F0 - 1F8	Fixed Disk Drive Adapter
200 - 207	Game I/O
20C - 20D	Reserved
21F	Reserved
278 - 27F	Parallel Printer Port 2
2B0 - 2DF	Alternate Enhanced Graphic Adapter
2E1	GPIB Adapter 0
2E2 - 2E3	Data Acquisition Adapter 0
2F8 - 2FF	Serial Port 2 (RS-232-C)
300 - 31F	Prototype Card
360 - 363	PC Network (Low Address)
364 - 367	Reserved
368 - 36B	PC Network (High Address)
36C - 36F	Reserved
378 - 37F	Parallel Printer Port 1
380 - 38F	SDLC, Bisynchronous 2
390 - 393	Cluster
3A0 - 3AF	Bisynchronous 1
3B0 - 3BF	Monochrome Display and Printer Adapter
3C0 - 3CF	Enhanced Graphics Adapter
3D0 - 3DF	Color/Graphics Monitor Adapter
3F0 - 3F7	Diskette Drive Controller
3F8 - 3FF	Serial Port 1 (RS-232-C)
6E2 - 6E3	Data Acquisition Adapter 1
790 - 793	Cluster Adapter 1

AE2 - AE3	Data Acquisition Adapter 2
B90 - B93	Cluster Adapter 2
EE2 - EE3	Data Acquisition Adapter 3
1390 - 1393	Cluster Adapter 3
22E1	GPIB Adapter 1
2390 - 2393	Cluster Adapter 4
42E1	GPIB Adapter 2
62E1	GPIB Adapter 3
82E1	GPIB Adapter 4

APPENDIX E: INTERRUPT ASSIGNMENTS

LEVEL	TYPICAL INTERRUPT SOURCE
NMI	Parity, AT Channel Check
IRQ0	Interval Timer 1, Counter 0 Out
IRQ1	Keyboard Controller
IRQ2	Cascade Interrupts from IRQ8 to IRQ15
IRQ3	Serial Port 2
IRQ4	Serial Port 1
IRQ5	Parallel Port 2
IRQ6	Diskette Controller
IRQ7	Parallel Port 1
IRQ8	Real Time Clock
IRQ9	Expansion Bus Pin
IRQ10	Expansion Bus Pin
IRQ11	Expansion Bus Pin
IRQ12	Expansion Bus Pin
IRQ13	Coprocessor Error
IRQ14	Fixed Disk Drive Controller
IRQ15	Expansion Bus Pin

Product Information Record

Date Purchased or Received	
Purchased From	
Product Name	
Product Revision	
CPU Processor Speed	
Memory Size	
Serial Number	
BIOS Version	
Software Driver Version	

Record all the above information as you received the product for future reference.