54CPI

Pentium ISA/PCI System Board

USER'S MANUAL

Revision 3.0

Quick Reference Section

Warning !!!

Cooling fan and heat sink must be placed
on the Pentium CPU at all times.
Manufacturers of motherboard and CPU
are not responsible for any damages
due to the absence of cooling fan and heat sink.

QUICK INTRODUCTION

CPU installation

The 54CPI supports Intel Pentium 75/90/100/120/133/150/167MHz microprocessors. Carefully install the Pentium processor into the ZIF socket at location U25. Make sure Pin One of the CPU corresponds to Pin One of the socket.

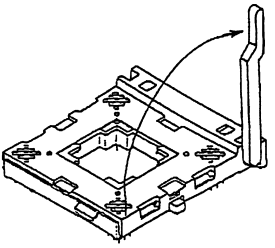
Power supply

The 54CPI system board has a built-in voltage regulator to convert the typical 5.0 Volt output from the regular PC/AT compatible power supply to the 3.3 Volts required for the Pentium processor. You do not need to have a special power supply with 3.3 Volts output for the system board.

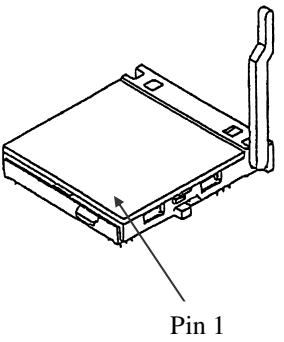
CPU INSTALLATION INSTRUCTIONS

54CPI uses a Single Lever ZIF (Zero Insertion Force) PGA (Pin Grid Array) socket for your CPU. To install your CPU, follow the steps below:

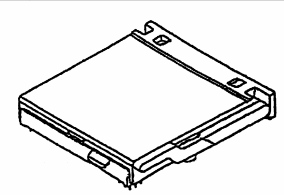
1. Rotate the actuator arm 90 degrees to its fully up right position.



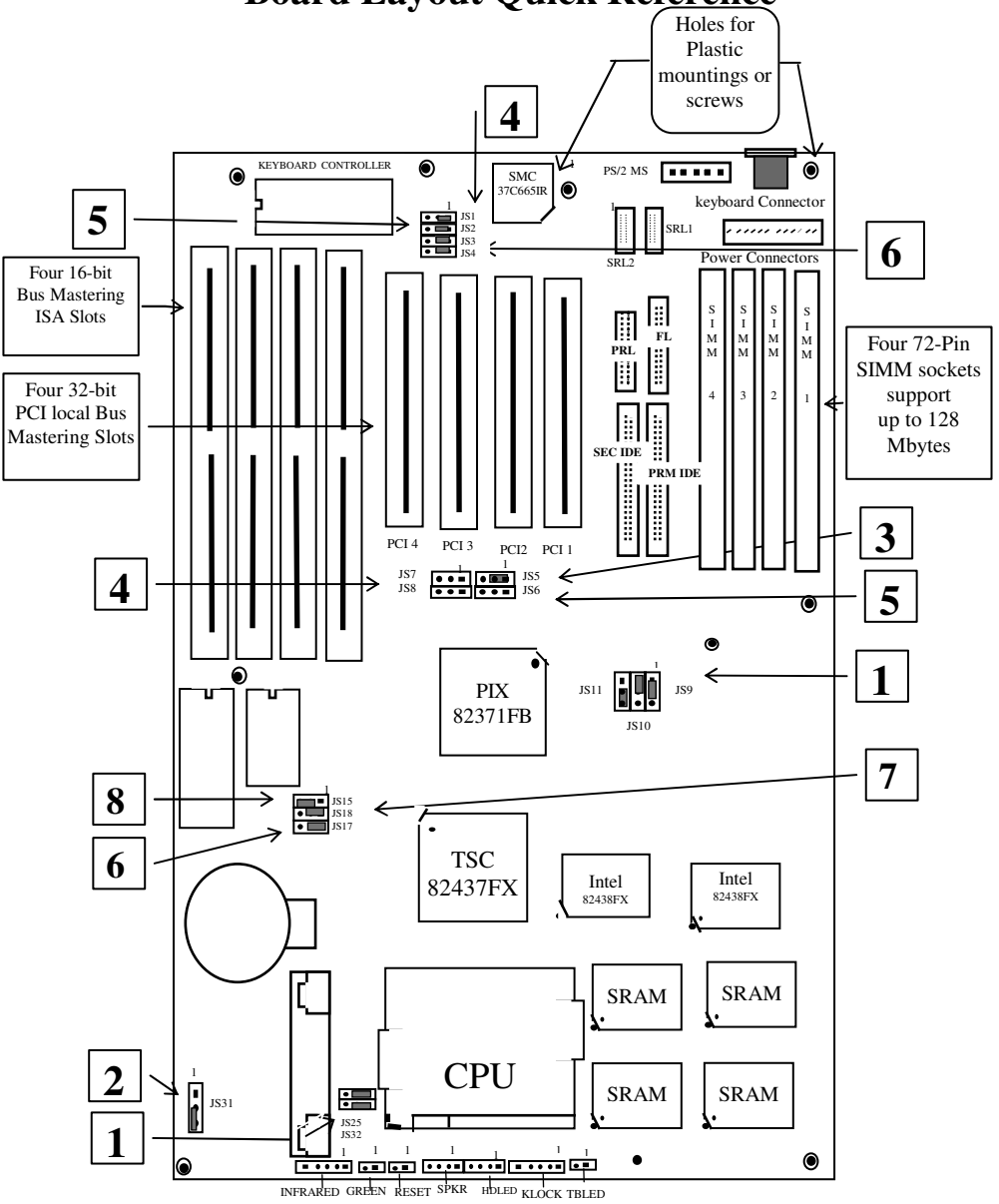
2. To insert the CPU, make sure the notched corner of the CPU is placed adjacent to the Pin One on the socket. The pins of CPU must be aligned with the holes of the sockets. **No force should be required to insert the CPU into the socket.**



3. Rotate the actuator to a horizontal position, making sure it locks under the detent.
   The CPU is now installed!
   To remove the CPU, simply reverse the same procedure as shown and gently lift the CPU out of the socket.



Board Layout Quick Reference



Remark: *The sample jumper setting shown above is set at Pentium-90MHz, 256K cache size.*

JUMPER SETTING QUICK REFERENCE:

1) CPU clock Frequency Selection Jumper

CPU speed	JS9	JS10	JS11	JS25	JS32
75 MHz	1-2	2-3	1-2	1-2	1-2
90 MHz (Default)	***1-2***	***1-2***	***2-3***	***1-2***	***1-2***
100 MHz	2-3	2-3	2-3	1-2	1-2
120 MHz	1-2	1-2	2-3	1-2	2-3
133MHz	2-3	2-3	2-3	1-2	2-3
150MHz	1-2	1-2	2-3	2-3	2-3
167MHz	2-3	2-3	2-3	2-3	2-3

2) CPU Voltage Type Jumper

CPU Voltage	JS31
Standard(STD) or VR	***2-3***
VRE	1-2

3) Parallel Port Interrupt Select

Interrupt	JS5 (3-pin)
Interrupt 7	***1-2***
Interrupt 5	2-3

4) ECP DMA Channel Setting

ECP Mode	JS1 (3-pin)	JS7 (3-pin)	JS8 (3-pin)
Normal Mode	***2-3***	***OPEN***	***OPEN***
DMA 3 Selected	1-2	1-2	1-2
DMA 1 Selected	1-2	2-3	2-3

5) Enhanced Floppy

Floppy Mode	JS2 (3-pin)	JS6 (3-pin)
Normal	***2-3***	***OPEN***
Enhanced	1-2	2-3

6) CMOS Clear Jumper

CMOS	JS18 (3-pin)
Normal CMOS Operation	***1-2***
Clear CMOS Data	2-3

7) Flash BIOS Programming

Flash BIOS	JS17 (3-pin)
+12V Programming	***1-2***
+5V Programming	2-3

8) Display Type Jumper

Display Type	JS15 (3-pin)
Monochrome, EGA, VGA	***2-3***
CGA	1-2

NOTE: Refer to chapter 2 “System Board Jumpers” Section for more detailed information.

CMOS SETUP QUICK REFERENCE

For Quick Setup (recommended)

1. Go to STANDARD CMOS SETUP to set Date, Time, Hard drive type, and Floppy drive type.
2. From main menu, use the TAB key or mouse to go to the DEFAULT SETUP menu. Select ***Optimal*** icon. Select Yes to load the Optimal values.

For manual setup (For advanced user who has high technical understanding)

3. Select ADVANCED CMOS SETUP, ADVANCED CHIPSET SETUP, and POWER MGMT SETUP menus to set each option individually.

I. STANDARD SETUP:

Primary Master	: Not Installed
Primary Slave	: Not Installed
Secondary Master	: Not Installed
Secondary Slave	: Not Installed
Floppy Drive A	: Not Installed
Floppy Drive B	: Not Installed
Base Memory Size	: 640 KB
Ext. Memory Size	: Size of Ext. Memory installed

II. ADVANCED CMOS SETUP

Option Name	Optimal	Failsafe
Quick Boot	**Enabled**	**Disabled**
BootUp Sequence	**C:,A:,CDROM**	**A:,C:,CDROM**
BootUp Num-Lock	**On**	**On**
Floppy Drive Swap	**Disabled**	**Disabled**
Floppy Drive seek	**Disabled**	**Disabled**
Mouse Support	**Enabled**	**Disabled**
Primary Display	**VGA/EGA**	**VGA/EGA**
Password Check	**Setup**	**Setup**
OS/2 Compatible Mode	**Disabled**	**Disabled**
Internal Cache	**Write Back**	**Write-Thru**
External Cache	**Enabled**	**Disabled**
System BIOS Cacheable	**Enabled**	**Disabled**
C000,16k Shadow	**Cached**	**Disabled**
C400,16k Shadow	**Cached**	**Disabled**
C800,16k Shadow	**Disabled**	**Disabled**
CC00,16k Shadow	**Disabled**	**Disabled**
D000,16k Shadow	**Disabled**	**Disabled**
D400,16k Shadow	**Disabled**	**Disabled**
D800,16k Shadow	**Disabled**	**Disabled**
DC00,16k Shadow	**Disabled**	**Disabled**

III. ADVANCED CHIPSET SETUP

Option Name	Optimal	Failsafe
Memory Hole	**Disabled**	**Disabled**
DRAM Speed	**70ns**	**70ns**
IRQ12/M Mouse Function	**Enabled**	**Disabled**
8Bit I/O Recovery Time (Sysclk)	**1**	**4**
16Bit I/O Recovery Time (Sysclk)	**1**	**4**

IV.POWER MANAGEMENT

Option Name	Optimal	Failsafe
Power Management/APM	**Disabled**	**Disabled**
Instant-On Timeout (Minute)	**Disabled**	**Disabled**
Green PC Monitor Power State	**Standby**	**Standby**
Video Power Down Mode	**Disabled**	**Disabled**
Hard Disk Power Down Mode	**Disabled**	**Disabled**
Hard Disk Time Out (Minute)	**Disabled**	**Disabled**
Standby Time Out (Minute)	**Disabled**	**Disabled**
Suspend Time Out (Minute)	**Disabled**	**Disabled**
Slow Clock Ratio	**1:8**	**1:8**
Display Activity	**Ignore**	**Ignore**
IRQ3	**Monitor**	**Ignore**
IRQ4	**Monitor**	**Ignore**
IRQ5	**Ignore**	**Ignore**
IRQ7	**Monitor**	**Ignore**
IRQ9	**Ignore**	**Ignore**
IRQ10	**Ignore**	**Ignore**
IRQ11	**Ignore**	**Ignore**
IRQ12	**Monitor**	**Ignore**
IRQ13	**Ignore**	**Ignore**
IRQ14	**Monitor**	**Ignore**
IRQ15	**Monitor**	**Ignore**

V. PCI/PnP SETUP DEFAULTS

Option Name	Optimal	Failsafe
Plug and Play Aware O/S	**No**	**No**
PCI Burst Mode	**Enabled**	**Disabled**
PCI Streaming	**Enabled**	**Disabled**
PCI Latency Timer (PCI Clocks)	**64**	**248**
PCI VGA Palette Snoop	**Disabled**	**Disabled**
PCI IDE BusMaster	**Disabled**	**Disabled**
OffBoard PCI IDE Card	**Auto**	**Auto**
OffBoard PCI IDE Primary IRQ	**Disabled**	**Disabled**
OffBoard PCI IDE Secondary IRQ	**Disabled**	**Disabled**
PCI Slot1 IRQ Priority	**Auto**	**Auto**
PCI Slot2 IRQ Priority	**Auto**	**Auto**
PCI Slot3 IRQ Priority	**Auto**	**Auto**
PCI Slot4 IRQ Priority	**Auto**	**Auto**
IRQ3	**PCI/PnP**	**PCI/PnP**
IRQ4	**PCI/PnP**	**PCI/PnP**
IRQ5	**PCI/PnP**	**PCI/PnP**
IRQ7	**PCI/PnP**	**PCI/PnP**
IRQ9	**PCI/PnP**	**PCI/PnP**
IRQ10	**PCI/PnP**	**PCI/PnP**
IRQ11	**PCI/PnP**	**PCI/PnP**
IRQ14	**PCI/PnP**	**PCI/PnP**
IRQ15	**PCI/PnP**	**PCI/PnP**

VI. Peripheral Setup

On board FDC	**Auto**	**Auto**
On board Serial port 1	**Auto**	**Auto**
On board Serial port 2	**Auto**	**Auto**
On board Parallel port	**Auto**	**Auto**
Parallel port Mode	**Normal**	**Normal**
On board PCI IDE	**Both**	**Both**

MEMORY CONFIGURATION QUICK REFERENCE

The 54CPI's on-board DRAM memory subsystem support 1Mx36, 2Mx36, 4Mx36 and 8Mx36 DRAM Modules. DRAM speed must be 70ns or faster. The table below shows some of the variety of ways to configure the memory.

SIM1 & SIM2	SIM3 & SIM4	TOTAL
1Mx36	None	8 Mbyte
1Mx36	1Mx36	16 Mbyte
1Mx36	4Mx36	40 Mbyte
2Mx36	None	16 Mbyte
2Mx36	2Mx36	32 Mbyte
2Mx36	4Mx36	48 Mbyte
2Mx36	8Mx36	80 Mbyte
4Mx36	none	32 Mbytes
4Mx36	4Mx36	64 Mbyte
8Mx36	None	64 Mbyte
8Mx36	8Mx36	128 Mbyte

Note: 1. You can use 70ns or faster memory for 54CPI. Please see chapter 3, Hardware Installation, for more detailed information.

2. SIMMs must be installed by groups of SIM & SIM2 or SIM3 & SIM4.

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54CPI

Pentium ISA/PCI System Board

USER'S MANUAL

Revision 3.0

PREFACE

Thank you for purchasing the 54CPI system board. This document will aid you to properly configure and install this system board into your computer system. The document is prepared to the best of our knowledge; however, we make no representation or warranty concerning the contents or use of this manual, and specifically disclaim any expressly implied warranties or merchantability or fitness of any particular purpose. The information in this document is subject to change without notice.

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- Microsoft is a registered trademark of Microsoft Corporation.
- PCI is a registered trademark of PCI Special Interest Group.
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Technical References

- Pentium[tm] Microprocessor Family User's Manual.
- Intel PCIset 82437FX (TSC) Cache/Memory Subsystem.
  Intel PCIset 82438FX (TDP) Data Buffer
  Intel PCIset 82371FB (PIIX) ISA/IDE Controller
- The Peripheral Component Interconnect (PCI) Specification

TABLE OF CONTENTS

CHAPTER 1: INTRODUCTION

PRODUCT OVERVIEW

The 54CPI system board is a powerful combination of performance, quality, and innovative system board design to address the needs of today's high performance systems. With Pentium 75/90/100/120/133/150/167MHz support, optional 256K/512K external Level 2 fast write-back Cache Memory, and 64-bit BURST bus DRAM Memory, the board brings exceptional processing power that could only be achieved by Mini-computers just a few years ago to the Personal Computer (PC). Incorporating the new emerging industry standard Peripheral Component Interconnect (PCI) Local Bus together with the standard 16-bit Industry Standard Architecture (ISA) bus, the board dramatically boosts system I/O throughput for even the most demanding applications in today's market.

Features

CPU Support

- 320-pin ZIF socket for P54C & P54CT(Intel Pentium 75/90/100/120/133/150/167MHz) with built-in 16KB of fast Cache Memory.

Cache Memory

- Supports 256K and 512K High speed External Write-back 3.3V or mixed mode low power consumption Cache RAM.

System Memory DRAM

- 2 Banks of Memory that support EDO or Fast Page Mode 72 pins SIMM, with capacity of 1MB, 2MB, 4MB, 8MB, 16MB, and 32MB, both x32 and x36 bits SIMM types can be used.

  70ns or faster; 64-bits Interleaved. (Minimum 2 pieces of

  DRAM modules must be installed.)

- Up to 128MBytes on-board memory.

System BIOS

- 1 Megabit of AMI BIOS with Built-in Window standard CMOS, Advanced CMOS, Advanced Chipset, Configuration Utilities, Password, Power Management Setup Menus.

System Chipset

- Intel Triton, Pentium-to-PCI/ISA Chipset. Provides excellence PCI/ISA compatibility.

PCI/ISA Bus

- Four 32-bit Bus Master PCI bus slots.
- Four ISA slots.

Real Time Clock:

- Real Time Clock with built-in Battery to provide very accurate timer clock.

Board Form Factor

- Standard Baby AT form factor and mounting holes.

Product Specifications

Electrical

Power (System board only):	26 Watts @ 5VDC 0.06 Watts @ ± 12VDC

Environmental

Operating temperature (ambient):	O^0C to 55^0C
Non-Operating temperature:	-42^0C to 70^0C
Relative Humidity:	90% RH @ 36^0C
MTBF	120,000 Hours
Airflow Requirement:	100LFM with on-board fan.

Dimensions

Width:	8.700 inches (221.98 mm)
Length:	12.000 inches (330.20 mm)

TECHNICAL OVERVIEW

Pentium[tm] Microprocessor

The 54CPI supports P54C and P54CT(75/90/100/120/133/150/167 MHz). The microprocessor incorporates the following features:

- 16KB Internal Cache Memory in a 2-way 32-Byte Line Size. The Cache Memory is separated into two 8KB each for Data and Code for performance improvement.
- 32-bit Address and 64-bit Data interfaces
- 4 Gigabytes (Giga = 1,073,741,824) of physical address space
- 64 Terabytes (Tera = 2 to the power of 40) of virtual address space
- Binary Compatible with Large Software Base such as DOS, OS/2, UNIX, Windows,Windows95,WindowNT, Netware, etc.,
- Advanced Design Features such as Branch Prediction, Virtual Mode Extensions
- Built-in 80387 Compatible high performance Floating-point Instruction Execution Unit.

Cache Memory

The increase in speeds of DRAM over the last few years has not kept pace with the increase in microprocessor speeds. This requires very fast and unavailable DRAMs or many wait states have to be inserted to the CPU memory cycles. System performance decreases as the number of wait states increases.

Cache memory is small but can be accessed very fast. The code and data frequently accessed by the CPU normally is stored here. The Pentium Microprocessor has a built-in 16KB that is

separated into two 8KB of Code and Data Cache. When the Pentium processor accesses memory, it checks if data is in the cache memory and, if the data is there, it will fetch that instead of going to much slower main system memory. This is a cache hit situation. It is possible that 95 to 99 memory accesses out of 100 memory accesses are cache hits depending on the application software.

An optional 256KB to 512KB external write-back OR write-through cache memory is provided on the 54CPI system board to achieve an even higher performance. This external cache requires eight pieces of 32Kx8, 64Kx8 fast SRAM chips. With external cache memory, the memory hit rate of the system will be further improved so that the overall performance is higher. Please see Appendix C section for system memory mapping with cached and non-cached locations.

Main System Memory (DRAM)

The main memory subsystem of the 54CPI consists of 640K of DRAM memory below 1 Megabyte address space, 256K of I/O ROM BIOS, 128KB of system BIOS ROM, and up to 127MB (128MB - 1MB of Base and reserve mem) of extended system memory.

System ROM

The BIOS ROM is provided in a single 8-bit EPROM, which can hold up to 128KB of code and data. It is accessible at the top of the system's 4 GB memory address space and at the top of the first Megabyte of memory. The BIOS ROM supports all PCI/ISA compatible features. In addition, a Shadow RAM feature is provided to allow the BIOS code and VIDEO BIOS to be executed from 32-bit system DRAM resident at the same physical address..

The processor is reset when power is turned on or when the RESET switch is used. After RESET, the Pentium CPU is initialized to a known internal state and begins fetching instructions, out of the BIOS ROM, from the reset address FFFFFFF0. This address leads to the entry point of the power-

on system initialization procedure stored in BIOS ROM. The BIOS system initialization procedure consists of the following functions:

- Power-on self-tests such as BIOS Check Sum Test, system DRAM Test, Battery- Backed CMOS RAM Test.
- Initializing all the standard compatible I/O components such as Interrupt Controllers, DMA Controllers (Intel 8237A register compatible), Keyboard Controller (Intel 8742 register compatible), Video Controller (CGA, EGA, VGA, etc..), System Timers (Intel 8254 register compatible).
- Initializing all the PCI/ISA add-on cards based on the information stored in the CMOS.
- Built-in SETUP program, if allowed, is used for system configuration such as:
  - . Day/Time setting
  - . Selection for floppy disk and hard disk types
  - . Shadow RAM, Cache Memory Enable, Disable options.
  - . Auto Detect IDE Hard Drives
  - . Virus Protection and Password for Security

Besides initializing the system, the BIOS ROM also provides BIOS interrupt calls for such functions as video access, floppy disk access, printer access, etc..

DRAM control Logic

The DRAM control logic on the 54CPI system board is designed and optimized for the Pentium CPU. Unlike most other systems with a separate cache controller, the DRAM control logic is tightly coupled with the on-chip cache controller. When CPU address becomes available for a new memory cycle, both controllers operate in parallel. If the cycle is a read hit or a write hit, the cache controller will take control of the cycle while the DRAM controller stays in idle. If the cycle is a read miss, the DRAM controller will cooperate with the cache controller to generate appropriate cycles to write the data from the cache

memory back to the system memory, if the cache data line is dirty, then read data from the system memory to the CPU and update the cache memory. If the cycle is a write miss, the DRAM controller simply takes control to write the data to the system memory while the cache controller stays in idle. The DRAM controller and the system memory support the Pentium 128Byte-burst memory read cycles and fast-page mode cache write back cycles for the highest performance.

The on-board DRAM is configured in a 72-bit-wide arrangement consisting of 64 bits of data and 8 bits of parity. Each parity bit is directly associated with one of the 8 bytes in the 72-bit double long word. At least two SIMMs are required to have a system running at full 64-bit data path.

Shadow DRAM Feature

The 54CPI supports the Shadow DRAM feature which allows the BIOS ROM, VIDEO ROM, and I/O ROM codes to be executed from the system DRAM resident at the same physical address space. The Shadow DRAM feature significantly improves the system performance in BIOS-call intensive applications because executing code out of 64-bit DRAM is very much faster than from 8-bit of the EPROMs.

PCI/ISA Compatible Expansion Bus

The 54CPI system board has 4 32-bit PCI Expansion Bus connectors and 4 16-bit ISA Expansion Bus connectors for interfacing with all PCI and ISA compatible I/O, memory, and bus mastering adapters.

Introduction to PCI Local Bus

PCI is an electrical specification and logic requirement for a local bus standard, i.e. a multiplexed extension of the CPU bus. PCI defines a standard I/O component level interface that permits all PCI Local Bus products to be totally interchangeable and directly connected without using any glue logic.

What PCI Accomplishes

PCI is a way to physically interconnect highly integrated peripheral components and processor/memory systems.

PCI Features

- Up to 4 PCI loads can be used in the same system on the PCI expansion slots, not including the PCI Controller and an expansion bus controller for ISA, or MCA. PCI de-couples the CPU from the expansion bus and works at 33 MHz but can use either a 32-bit or 64-bit data connection path to the CPU is processor-independent.
- Has a multiplexed address, command, and data bus and supports burst mode operation on reads and writes.
- Runs synchronous with the CPU at speeds up to 33 Mhz, has a maximum data transfer rate of 120 MBs (with a peak rate of 132 MBs on a 32-bit data path).
- Has an optional 64-bit data path that is transparently inter-operable with the 32-bit data path.
- Has low latency random accesses (about 60ns write access latency) to slave registers from a PCI bus master on the PCI bus.
- Is capable of full concurrence with the processor and PCI bus masters.
- Has full multi-master capability, allowing any PCI Master peer-to-peer access to any PCI slave.
- Has hidden and overlapped central arbitration.
- Has a low pin count (master - 47; slave - 45),
- Has address and data parity, and uses three physical address spaces: 32-bit memory, 32-bit I/0, and a 256 byte-per-agent configuration space.

- The PCI Controller buffers reads and writes between the memory/CPU and PCI peripheral devices.
- The CPU in a PCI system runs concurrently with PCI bus mastering peripherals. Although bus mastering peripheral devices are arbitrated, significant data transfer rate improvements can be achieved without splitting resource utilization between the CPU and a bus mastering device. Peripheral devices can operate at up to 33 MHz in a PCI environment.
- PCI devices can be bus masters, slaves, or a combination of bus master and slave.
- The PCI specification also provides for burst mode of any length for both reads and writes.
- PCI is a multiplexed bus. Multiplexing allows more than one signal to be sent on the same electrical path. The control mechanisms have been modified and extended to optimize I/0 support.

ISA BUS

The Industry Standard Architecture(ISA) is 16-bit data transfer, addressing capabilities to the AT Bus Architecture.

ISA Features

- 16-bit addressing and data transfers
- Data transfer rates up to 8MB/s.

Setup information writes to system board battery backed CMOS RAM and to special I/O ports.

ISA Compatible Peripherals

The 54CPI system board provides the following standard peripherals:

- Enhanced DMA functions with seven independently programmable channels.
- Two 82C59A compatible Interrupt Controllers.
- Four 82C54 compatible programmable interval timers.
- One keyboard controller.
- Real time Clock controller with 114Bytes of CMOS SRAM

CHAPTER 2: BOARD'S JUMPERS & CONNECTORS

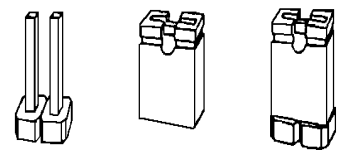
When working with the 54CPI, it is extremely important that you avoid Electrical Static Discharge (ESD). Always ground yourself by wearing a grounded wristband or ankle strap.

Figure 1 on the next page shows the component layout of the 54CPI system board with locations of the system board jumpers and connectors. Note that most jumpers and 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 jumpers and connectors.

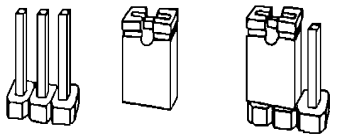
JUMPER DESCRIPTIONS

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 jumper 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 or placed on only one pin, 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.

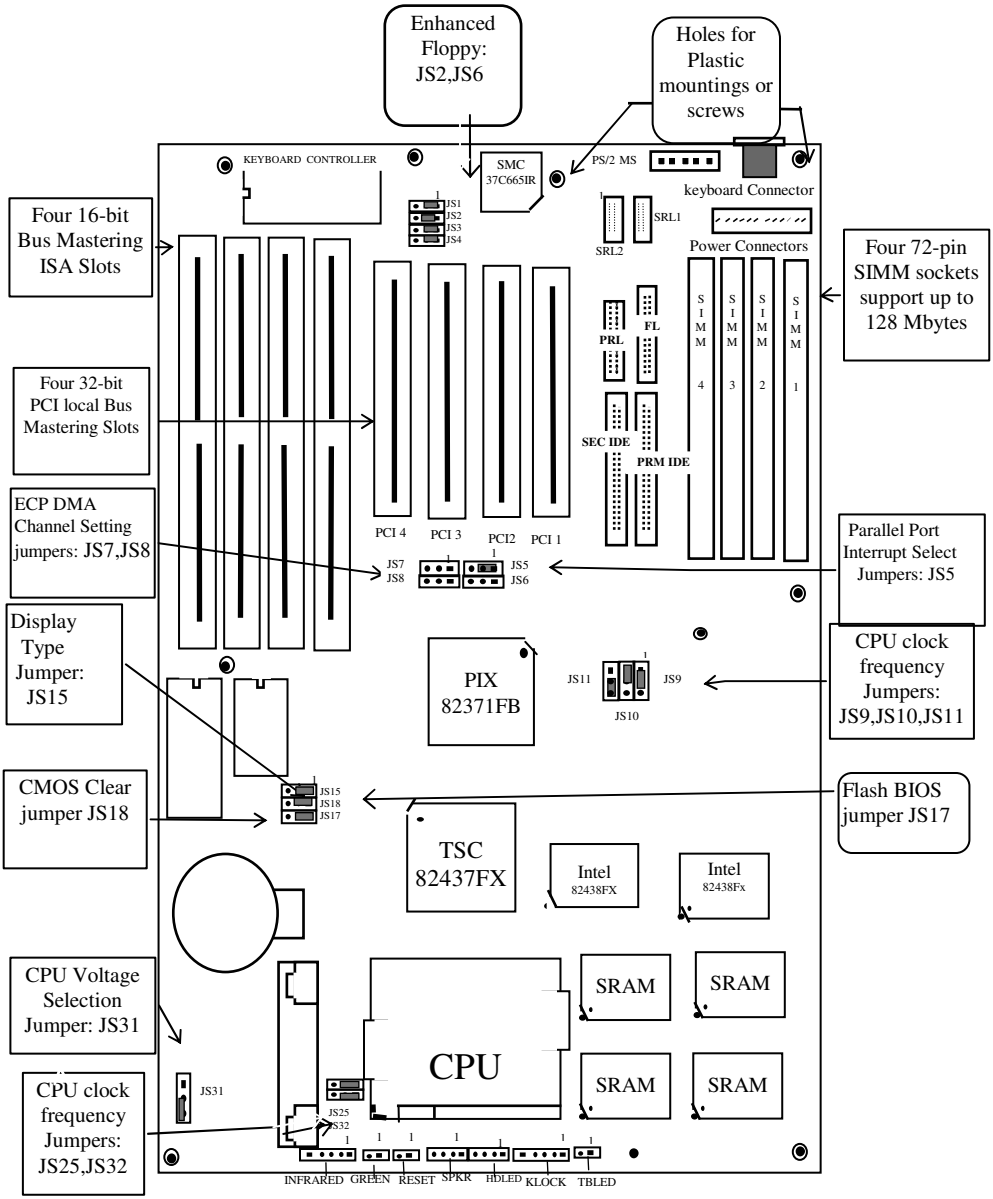


2-pin jumper



3-pin jumper

Figure 1: 54CPI Component Layout



Remark: *The sample jumper setting shown above is set at Pentium-90MHz, 256K cache size.*

CPU Jumpers

CPU Clock Frequency Jumpers

The 54CPI supports 75/90/100/120/133/150/167MHz Pentiums. The jumpers should be set to the corresponding CPU speeds.

CPU speed	JS9	JS10	JS11	JS25	JS32
75 MHz	1-2	2-3	1-2	1-2	1-2
90 MHz (Default)	*1-2*	*1-2*	*2-3*	*1-2*	*1-2*
100 MHz	2-3	2-3	2-3	1-2	1-2
120 MHz	1-2	1-2	2-3	1-2	2-3
133MHz	2-3	2-3	2-3	1-2	2-3
150MHz	1-2	1-2	2-3	2-3	2-3
167MHz	2-3	2-3	2-3	2-3	2-3

CPU Voltage Type

CPU Voltage	JS31
Standard (STD) or VR	**2-3**
VRE	1-2

Peripheral Jumpers

Parallel Port Interrupt Select Jumper

Interrupt for Parallel Port can be optionally set to IRQ7 or IRQ5 by this jumper.

Parallel Port Interrupt	JS5(3-pin)
Interrupt 7	***1-2***
Interrupt 5	2-3

Extended Capabilities Port (ECP) Jumpers

The onboard Parallel Port Controller supports PC/AT Compatible Mode (Normal mode), High Speed HP and Microsoft Compatible Extended Capabilities Port mode (ECP). In Normal mode, system CPU will handle data transfer from the FIFO buffers of the Parallel Port Controller to system memory. In ECP mode, to improve data transfer rate, system DMA will be used to handle the data transfer. (For more information about ECP mode, please refer to Extended Capabilities Port Protocol and ISA Interface Standard specification that is available from Microsoft Corporation)

ECP Mode	JS1	JS7	JS8
Normal Mode	***2-3***	***Open***	***Open***
DMA 3 Selected	1-2	1-2	1-2
DMA 1 Selected	1-2	2-3	2-3

Enhanced Floppy

Floppy Mode	JS2	JS6
Normal	***2-3***	***OPEN***
Enhanced	1-2	2-3

System Board Standard Jumpers

CMOS Clear Jumper

The jumper JS18 is used to clear all information, including password, currently stored in the CMOS RAM. (12887A on 54CPI board at location U18). It is typically used when you forget the password that you selected previously and you cannot get into the CMOS setup menu.

Function	JS18
Normal Operation (Default)	***1-2***
Clear CMOS Data	2-3

Display Type Jumper

This is PC/AT compatible jumper to inform the system BIOS that the graphic card installed is CGA or other types. Thus, the jumper should be set according to the type of graphic card installed in the system.

Display Type	JS15(3-pin)
VGA, EGA, Monochrome (Default)	***2-3***
CGA	1-2

Flash Program

Intel 28F001BX-T & SST 29EE010 Flash EEPROM can be used +12V to program the BIOS. For some other EEPROM +5V can be used to program

Flash BIOS Programming

Flash BIOS	JS17
+12V Programming	1-2
+5V Programming	2-3

CONNECTOR DESCRIPTIONS

Following is the list of 54CPI system board connectors required to be installed for proper system operation. For detailed descriptions of these

components, please refer to the next section. To avoid damaging the board and to have proper operation, caution should be taken when connecting these components.

- Power supply connectors (PS8 and PS9)
- Keyboard connector (KBCN)

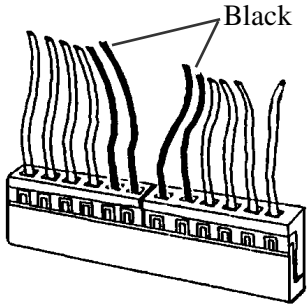
- Reset connector (RESET)
- Power LED and keyboard lock connector (KEYLOCK)
- Speaker connector (SPKR)
- Turbo LED connector (TBLED)
- Hard Disk Activity LED connector (HDLED)

- Parallel Port connector (LPT1)
- Serial Port 1 & 2 connectors (SRL1, SRL2)
- Floppy Interface connector (FDC1)
- IDE Interface connectors (IDE1, IDE2)

Power Supply Connectors (PS8 and PS9)

The two Power Supply connectors (PS8 and PS9) 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.

Pin	Connector PS8	Connector PS9
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 (KBCN) 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

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

Power LED and Keyboard Lock Connector

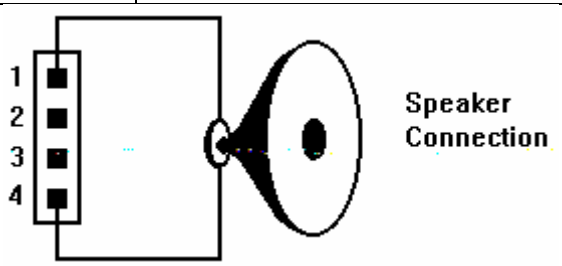
The Power LED and Keyboard Lock connector (KEYLOCK) is 5-pin keyed BERG strip. It is used to connect +5 VDC power to the power indicator LED at the front panel and connect security keyboard lock to the keyboard controller. This allows you to switch off the keyboard and so provide limited security against 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	Ground
3	Ground
4	+5 VDC



Turbo LED Connector

The Turbo LED connector (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 Anode
2	LED Cathode

Hard disk Activity LED Connector

The hard disk activity LED connector (HDLED) is a 4-pin keyed BERG strip. It is used to connect to front pannel hard disk LED.

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

Peripheral Connectors

Parallel Port Connector

The on-board parallel port connector (PARALL) is a 2x13-pin male header connector. The On-board Parallel Port can be disabled through the BIOS Setup. Please refer to Chapter 3 "Peripheral Management Setup" section for more detail information. 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

Pin	Description	Pin	Description
12	PE	25	Ground
13	SLCT	26	No Connection

The Integrated Parallel Port supports Extended Capabilities Port protocol (ECP) to provide a number of advantages for the parallel port as listed below:

- Use DMA channel 1 or 3 to transfer data across the Parallel port in both forward and reverse directions; therefore, processor time is saved for other tasks. This is especially important in multi-tasking operating systems such as the coming Windows Chicago.

- Peer-to-peer capability for networking.

  Single byte run length encoded (RLE) compression for improved throughput (64:1.)

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. The On-board Serial Ports can be disable through BIOS setup. Please refer to Chapter 3 “Peripheral Management Setup” section for more detail information. The pin assignment is defined below:

Pin	Description	Pin	Description
1	Carrier Detect (CD)	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

Floppy Interface Connector

The On-board Floppy Interface connector (FDC1) is 2x17-pin male headers. This interface supports two 5.25" or 3.5" floppy drives in any combination and also can be disabled if no floppy drives are present on the system. The On-board Floppy Port can be disabled through the BIOS setup. Please refer to Chapter 3 "Peripheral Management Setup" section for more detail information. Pin assignment is as follows:

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 Connectors

The on-board IDE Interface connectors (IDE1 and IDE2) are 2x20-pin male headers. JC5 is the Primary IDE port. JC6 is the Secondary IDE port. Each port supports up to two IDE devices. This interface can be disabled through BIOS setup. Please refer to Chapter 4 "Peripheral Management Setup" section for more detail information. Pin assignment of IDE is as follows:

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

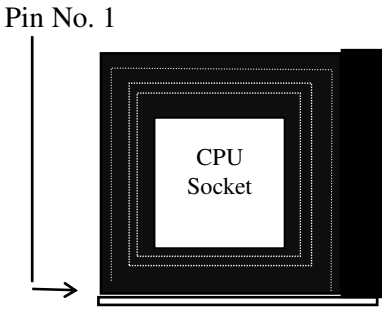
BUILDING A HIGH PERFORMANCE SYSTEM

The dimensions of the 54CPI system board are designed to fit perfectly in a PC/AT standard case. To build a complete high performance system based on the 54CPI system board, the following equipment is needed:

1. A chassis (Case) with dimensions similar to PC/AT standard chassis. The chassis should have a front Panel with connectors for Reset, Power, Keylock, Turbo switch, Turbo LED, Speaker, and Hard drive LED. AC Power cable is included with the chassis. The standard AT 200W power supply should be capable of providing a continuous power within a +4.75 VDC to +5.25 VDC range. A power line filter may be needed for areas with noisy transmission
2. One or two floppy drives (360K/1.2M/1.44M/2.88M).
3. A SCSI Hard disk drive or IDE hard disk drive with a hard drive controller.
4. A Video card (Monochrome, CGA, EGA, VGA). If the Video card is VGA, then it could be PCI interface type for the best display performance.
5. A video display monitor.
6. An AT-compatible keyboard (84 0r 101 Keyboard).
7. The following additional peripherals will be useful to enhance the system:
   - A bus or serial mouse.
   - A tape back up drive.
   - A CD-ROM drive.
8. Cables
   - A set of flat cables for floppy drive & hard disk drive.
9. Tools
   - Set of Screw drivers, Cutter, Pliers

CPU INSTALLATION

Care should be taken when installing the CPU into the Zero Insertion Force (ZIF) socket on the system board. Lift the handle of ZIF socket up. Place the Pentium processor into the ZIF socket. No force should be required to insert the CPU. On Pentium processors pin 1 is with the square base and it goes to particular hole on the socket. Match the hole and pin one first and then easily insert the processor into the socket. Press the handle gently down.



!! Important !!

Cooling fan installation

Mount the cooling kit with fan on top of the CPU. Connect power to fan from power supply. Make sure the cooling kit's bottom surface makes proper contact with top surface of CPU.

!! Warning !!

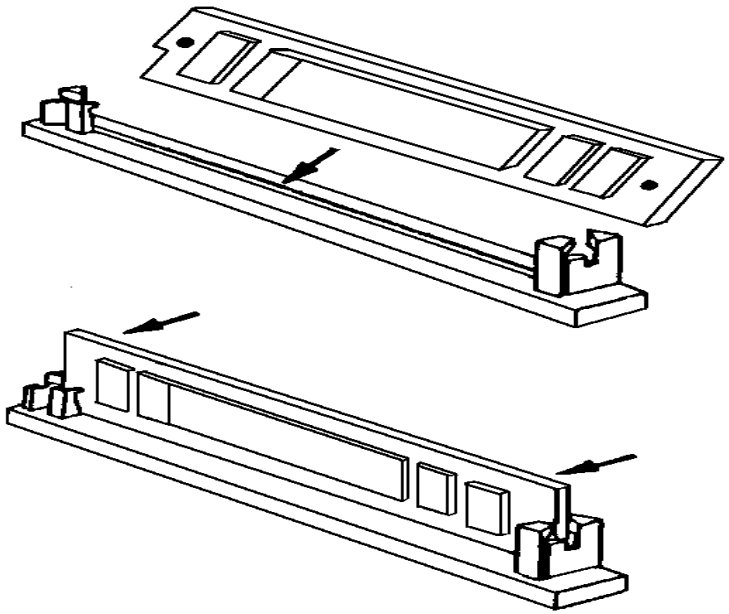
Manufacturer of the board or CPU is not responsible for damage to CPU because of improper handling during installation or cooling kit with fan is not used.

INSTALLING DRAM SIMMS

When working with DRAM SIMMs, it is extremely important that you avoid Electrical Static Discharge (ESD). Always ground yourself by wearing a grounded wristband or ankle strap.

1. Power must be off while installing SIMMs.
2. The SIMM module should face to the right with pin 72 next to the power supply connectors.
3. Insert the SIMM at a 45 degree angle, tilted towards ISA slots.
4. Gently push the SIMM to an upright position until it "snaps" into place.

Repeat above steps until the entire bank is filled.



The on-board DRAM memory sub-system has four module mounting sockets which are divided into “banks” of two sockets each. Sockets labeled SIM1 and SIM2 constitute bank 0. Sockets labeled SIM3 and SIM4 constitute bank 1. They support 1MB, 2MB, 4MB, 8MB, 16MB, and 32MB x32 or x36 DRAM SIMMs. DRAM speed must be 70ns or faster. Both EDO or Fast Page Mode DRAMs are supported.

Memory Configuration

SIM1 & SIM2	SIM3 & SIM4	TOTAL
1Mx36	None	8 Mbyte
1Mx36	1Mx36	16 Mbyte
1Mx36	4Mx36	40 Mbyte
2Mx36	None	16 Mbyte
2Mx36	2Mx36	32 Mbyte
2Mx36	4Mx36	48 Mbyte
2Mx36	8Mx36	80 Mbyte
4Mx36	none	32 Mbytes
4Mx36	4Mx36	64 Mbyte
8Mx36	None	64 Mbyte
8Mx36	8Mx36	128 Mbyte

The 54CPI supports both PCI slots and ISA slots. You can install the corresponding add-on cards into any of these slots. Make sure these add-on cards' interrupts or DMA channels do not conflict with each other. The best way to remember is to write down the information of all the installed cards into the back of this manual for later reference.

. PCI Add-on cards are normally automatically configured by system BIOS during boot up. However, some PCI add-on cards do have jumper settings for INTA or INTB. Write down the information if it is available for later reference.

  ISA add-on cards can be installed in provided ISA slots. Since there is no specific software that can automatically configure the ISA add-on cards, special care should be taken when setting Interrupt and DMA channels of ISA cards.

Please refer to the manuals shipped with the add-on cards for more information. Care should be taken when inserting the cards into the slots to make sure the connectors slots are not damaged.

CHAPTER 4: SYSTEM SETUP

SYSTEM CMOS

You need to setup the system CMOS every time:

- You start a new and un-configured 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.

You add, remove, or change DRAM from your system.

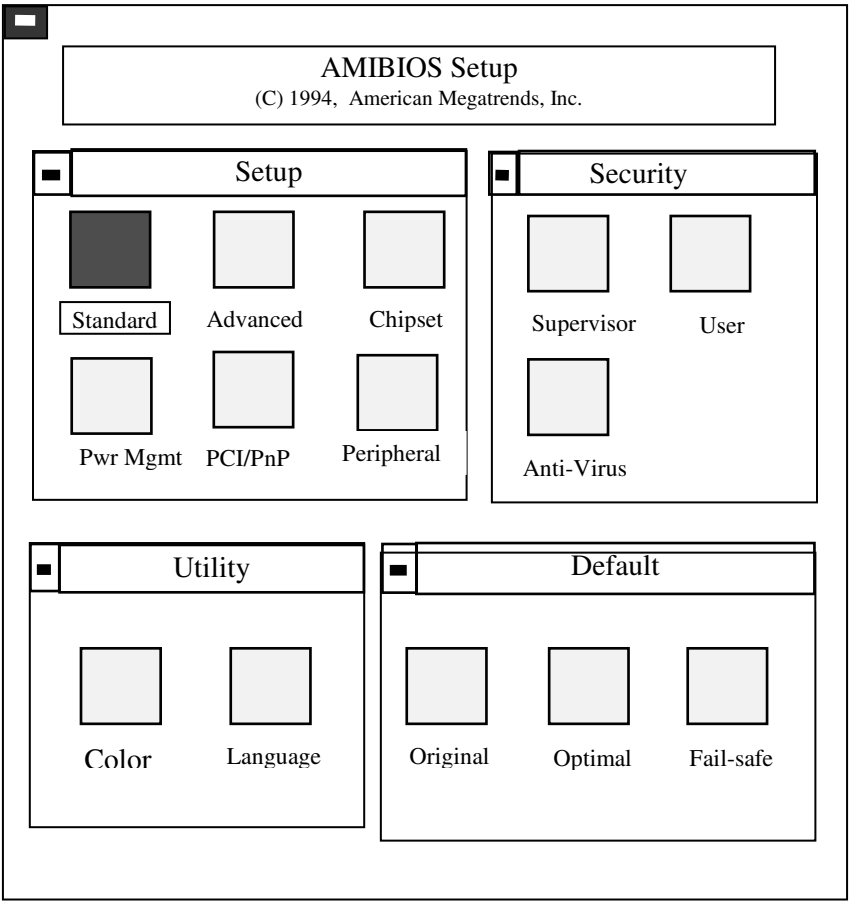
The first time you power up the system, the configuration information stored in the battery-backed CMOS RAM may not be correct. The BIOS detects this condition and prompts the user to go through the SETUP section. This chapter explains how to use the BIOS SETUP program and make the appropriate entries.

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 CMOS Setup

The System BIOS provides a Built-in Setup Utility that can be accessed by pressing < Del > key at the appropriate time during system boot up. Setup configuration data is stored in the system CMOS RAM.

The Following window will appear in the AMIBIOS Setup main screen. Details of setup options in each window is given in the following section:



Setup Window

Types of Setup	Description
Standard Setup	Sets time date, hard disk type, types of floppy drives, display type, and if Keyboard is installed.
Advanced Setup	Above 1 MB Memory Test, Parity Error check, System Boot Up Numlock, System Boot Up Sequence, Cache Memory, Adapter Shadow Cacheable, and many others.
Chipset Setup	Sets chipset-specific options and features.
PCI/PnP Setup	Sets options related to the PCI bus and Plug and Play features.
Peripheral Setup	Controlles I/O Controller-related options.

Power Mgmt	Controls I/0 Controller-related options.

Standard Setup

Standard Setup options are displayed by choosing the Standard icon from the WINBIOS Setup menu. All Standard Setup options are described below.

Date/Time

Select the Date/Time option to change the date or time. The current date and time are displayed. Enter new values through the displayed window.

Floppy Drive A, B

Choose the Floppy Drive A or B icon to specify the floppy drive type. The settings are *360 KB 5¼"*, *1.2 MB 5¼"*, *720 KB 3½"*, *1.44 MB 3½"*, or *2.88 MB 3½"*.

Pri Master
Pri Slave
Sec Master
Sec Slave

Choose these icons to configure the hard disk drive named in the option. When you click on an icon, the following parameters are listed: Type, LBA/Large Mode, Block Mode, 32Bit Mode, and PIO Mode. All parameters relate to IDE drives except **Type.**

Configuring an MFM Drive

If configuring an old MFM hard disk drive, you must know the drive parameters (number of heads, number of cylinders, number of sectors, the starting write precompensation cylinder, and drive capacity). Choose **Type** and choose the appropriate hard disk drive type (1 - 46).

User-Defined Drive

If you are configuring a SCSI drive or an MFM, RLL, ARLL, or ESDI drive with drive parameters that do not match drive types 1-46, you must select *User* in the **Type** field. You must then enter the drive parameters on the screen that appears. The drive parameters include:
Cylinder (number of cylinders),
Hd (number of heads),
WP (starting write precompensation cylinder),
Sec (number of sectors),
Size (drive capacity).

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 drives have 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)

Configuring IDE Drives

If the hard disk drive to be configured is an IDE drive, select the appropriate drive icon (Pri Master, Pri Slave, Sec Master, or Sec Slave). Choose the **Type** parameter and select Auto.
AMIBIOS automatically detects the IDE drive parameters and displays them. Click on the OK button to accept these parameters.
Click on **LBA/Large Mode** and choose *On* to enable support for IDE drives with capacities greater than 528 MB.
Click on **Block Mode** and choose *On* to support IDE drives that use Block Mode.
Click on **32Bit Mode** and click on *On* to support IDE drives that permit 32-bit accesses.
Click on **PIO Mode** to select the IDE Programmed I/O mode. The settings are *Auto, 0, 1, 2, 3, 4,* or *5.* Click on *Auto* to allow AMIBIOS to automatically choose the PIO mode that the IDE drive being configured uses. If you select *0-5* you must make absolutely certain that you are selecting the PIO mode supported by the IDE drive being configured.

Configuring a CD-ROM Drive

Select the appropriate drive icon (Pri Master, Pri Slave, Sec Master, or Sec Slave). Choose the **Type** parameter and select CDROM. You can boot the computer from a CD-ROM drive.

Advanced Setup

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

Quick Boot

Set this option to *Enabled* to instruct AMIBIOS to boot quickly when the computer is powered on. This option replaces the old **Above 1 MB Memory Test** Advanced Setup option. The settings are:

Setting	Description
Disabled	AMIBIOS test all system memory. AMIBIOS waits up to 40 seconds for a READY signal from the IDE hard 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 <Del> 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 *Hit <Del> to run Setup* message.

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

BootUp Sequence

This option sets the sequence of boot drives (floppy drive A:, hard disk drive C:, or a CD-ROM drive) that the AMIBIOS attempts to boot from after AMIBIOS POST completes. The settings are *C:,A:,CDROM, CDROM,C:,A:,* or *A:,C:, CDROM.* The default settings are *C:,A:,CDROM.*

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

This option allows the system BIOS to look for the floppy diskette in the floppy drives during boot up process. This is often set to disabled for systems which do not have floppy drives. The default setting is *Disabled.*

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 *Disabled.*

Primary Display This option specifies the type of display monitor and adapter in the computer. The settings are *Mono, CGA40, CGA80, 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 on 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.
The Optimal and Power-On defaults are *Setup.*

OS/2 Compatible Mode

Set this option to *Enabled* to permit AMIBIOS to run with IBM OS/2. The settings are *Enabled* or *Disabled.* The default settings are *Disabled.*

Internal Cache

This option specifies the caching algorithm used for L1 internal cache memory. The Advanced Chipset Setup

Setting	Description
Disabled	Neither L1 internal cache memory on the CPU or L2 secondary cache memory is enabled.
WriteBack (default)	Use the write-back caching algorithm.
WriteThru	Use the write-through caching algorithm.
Exte	

External Cache

External Cache This option specifies the caching algorithm used for L2 secondary (external) cache memory. The settings are:

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

System BIOS Shadow 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
CC00,16K Shadow
D000,16K Shadow
D400,16K Shadow
D800,16K Shadow
C000,16K 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
Shadow	The contents of C0000h - C3FFFh are written to the same address in system memory (RAM) for faster

Setting	Description
	execution.
Cache	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.
Disabled	The video ROM is not copied to RAM. The contents of the video ROM cannot be read from or written to cache memory.

The default setting is *Cache.*
In the AMIBIOS for the Intel Triton chipset, the E000h page is used as ROM during POST, but shadowing is disabled and the ROM CS# signal is disabled to make the E000h page available on the local bus.

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.*

DRAM Speed

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

Caution

If you have installed SIMMs with different speeds in the motherboard, select the speed of the slowest SIMM.

You must always use SIMMs that have the same speed within a memory bank.

IRQ12/M Mouse Function

Set this option to *Enabled* to specify that IRQ12 will be used for the mouse. The settings are *Disabled* or *Enabled*. The Optimal and Fail-Safe default settings are *Enabled.*

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 *2* and *4* respectively.

16-Bit I/O Recovery Time (SYSCLK)

This option specifies the length of the delay (in SYSCLKs) inserted between consecutive 16-bit I/O operations. The settings are *1, 2, 3, 4, 5, 6, 7,* or *8.* The Optimal and Fail-Safe default settings are *2*.

Power Management Setup

Power Management Setup options are displayed by choosing the Power Mgmt icon from the WINBIOS Setup main menu. All Power Management Setup options are described in this section.

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 *Disabled*.

Instant On Support

Set this option to *Enabled* to allow the computer to go to full power on mode when leaving a power-conserving state. *This option is only available if supported by the computer hardware.* AMIBIOS uses the RTC Alarm function to wake the computer at a prespecified time. The settings are *Enabled* or *Disabled.* The default settings are *Disabled.*

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 *Disabled, Off, Standby,* or *Suspend.* The default settings are *Disabled.*

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 *Disabled.*

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 (Min)

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

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

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 *1:1, 1:2* (half as fast as normal), *1:4* ((the normal clock speed*), 1:8, 1:16, 1:32, 1:64,* or *1:128*. The default setting is *1:1.*

Display Activity

This option specifies if AMIBIOS is to monitor activity on the display monitor for power conservation purposes. When this options set to *Monitor* and there is no display activity for the length of time specified in the value in **the Full-On to Standby Timeout (Min)** option, the computer enters a power saving state. The settings are *Monitor* or *Ignore.* The default settings are *Ignore.*

IRQ 3
IRQ 4
IRQ 5
IRQ 7
IRQ 9
IRQ 10
IRQ 11
IRQ 12
IRQ 13
IRQ 14
IRQ 15

These options enable event monitoring. When the computer is in a power saving mode, activity on the named interrupt request line is monitored by AMIBIOS. When any activity occurs, the computer enters Full On mode.

Each of these options can be set to *Monitor* or *Ignore*. The default setting for all options is *Ignore.*

PCI/PnP Setup

PCI/PnP Setup options are displayed by choosing the PCI/PnP Setup icon from the WINBIOS Setup main menu. All PCI/PnP Setup options are described in this section

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 *No.*

PCI Burst Mode

Set this option to *Enabled* to enable PCI burst mode. The settings are *Disabled* or *Enabled.* The Optimal default setting is *Enabled*. The Fail-Safe default setting is *Disabled.*

PCI Streaming:

Set this option to Enabled to permit streaming operations on the PCI bus. The settings are Enabled or Disabled. The optimal default setting is Enabled. The Fail-Safe default is disabled.

PCI Latency Timer (in 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 *Disabled, 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.*
In the AMIBIOS for the Intel Triton chipset, this option forces IRQ 14 and 15 to a PCI slot on the PCI local bus. This is necessary to support non-compliant PCI IDE adapter cards.

Offboard PCI IDE Primary IRQ

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

PCI Slot 1/2/3/4 IRQ Priority:

This option specifies the priority of ISA interrupt when using PCI adapters. The settings are auto, 3,4,5,7,9,10,11. The optimal and Fail-Safe default settings are auto.

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 NVRAM. 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*.

Peripheral Setup

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

Onboard FDC

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

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, 3E8h,* or *Disabled.* The Optimal default setting is *3F8h*. The Fail-Safe default setting is *Disabled.*

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 *2F8h, 2E8h,* or *Disabled.* The Optimal default setting is *3F8h*. The Fail-Safe default setting is *Disabled.*

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,* or *Disabled.*
The Optimal default setting is *378h.* The Fail-Safe default setting is *Disabled.*

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
Normal	The normal parallel port mode is used. This is the default setting.
Bi-Dir	Use this setting to support bidirectional transfers on the parallel port.
EPP	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.
ECP	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.

Parallel Port DMA

This option is only available if the setting for the **Parallel Port Mode** option is *ECP.*
The settings are *Disabled, DMA CH (channel) 0, DMA CH 1,* or *DMA CH 3*. The default setting is *Disabled.*

Onboard Triton PCI 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 *Primary.*

Programming Flash BIOS

To support FLASH BIOS, the component at location U19 must be a FLASH EPROM. Follow these steps to reprogram FLASH BIOS:

1. Turn the system power OFF.
2. Open the system cover and change JS17 jumper block to 2-3 position.(Intel Flash.).
3. Turn the system power ON.
4. Boot up the system and run AMIFLASH.COM Program from the Utility Diskette to load the new BIOS code into the FLASH EPROM.
5. After programming is completed, shut the system off.
6. Set the JS17 jumper block to 1-2 position and close the system cover.
7. Turn the system power ON.
8. Hit DEL key during boot up to go into the CMOS setup.
9. Use the TAB key to go to the Default Setup menu. Select Optimal icon and press YES to load the Optimal values.
10. Go to the Standard CMOS Setup to set Date, Time, Hard drive type, and Floppy drive type.
11. For manual setup, select Advanced CMOS Setup, Advanced Chipset Setup, and Power Management Setup menus to set each option indivdually.
12. After completed the setup, press ESC and select YES to save the CMOS setup.
13. Reboot the system.

APPENDIX A: 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

Type	Cylinder	Heads	Write Precomp	Landing Zone	Sectors	Size
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 B: ISA 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	i486 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

I/O ADDRESS (HEX)	I/O DEVICE
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
A2E1	GPIB Adapter 5
C2E1	GPIB Adapter 6
E2E1	GPIB Adapter 7

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: INTERRUPT LEVEL ASSIGNMENTS

LEVEL on SYSTEM	LEVEL on IO BUS	TYPICAL INTERRUPT SOURCE
NMI	None	Parity, ISA/EISA Channel Check, Bus Time Out, Fail Safe Timer Timeout
IRQ0	None	Interval Timer 1, Counter 0 Out
IRQ1	None	Keyboard Controller
IRQ2	None	Cascade Interrupts from IRQ8 to IRQ15
IRQ3	IRQ3	Serial Port 2
IRQ4	IRQ4	Serial Port 1
IRQ5	IRQ5	Parallel Port 2
IRQ6	IRQ6	Diskette Controller
IRQ7	IRQ7	Parallel Port 1
IRQ8	None	Real Time Clock
IRQ9	IRQ2	Expansion Bus Pin
IRQ10	IRQ10	Expansion Bus Pin
IRQ11	IRQ11	Expansion Bus Pin
IRQ12	IRQ12	Expansion Bus Pin
IRQ13	None	Coprocessor Error, DMA Chaining
IRQ14	IRQ14	Fixed Disk Drive Controller Expansion Bus Pin
IRQ15	IRQ15	Expansion Bus Pin

PRODUCT INFORMATION RECORD

Record all the information as you receive the product and provide to your supplier in writing in the event that you should need technical support assistance. This will help to speed up the response and get your problem solved.

System Board

Date Purchased or Received: _____

Purchased From: _____

Product Name: _____PCB Ver:_____ Rev: ___

Serial Number: _____

CPU Processor Speed: _____Memory Size: _____

BIOS Version: _____ Software Driver Rel #: _____

PCI Add-on Cards:

Model #_____ Interrupt:_____ Slot #:_____

Model #_____ Interrupt:_____ Slot #:_____

Model #_____ Interrupt:_____ Slot #:_____

ISA Add-on Cards:

Model #_____Interrupt:____ DMA: ____ Slot #:_____

Model #_____Interrupt:____ DMA: ____ Slot #:_____

Model #_____Interrupt:____ DMA: ____ Slot #:_____

Model #_____Interrupt:____ DMA: ____ Slot #:_____