

PT-5IV

SYSTEM BOARD

(VER. 1.x) / (VER. 2.x)

OPERATION MANUAL

TABLE OF CONTENTS

| Chapter & Section | Page |
|---|-------------|
| 1. INTRODUCTION | 1-1 |
| 1.1 SYSTEM OVERVIEW | 1-1 |
| 1.2 FEATURES | 1-1 |
| 2. SPECIFICATIONS | 2-1 |
| 3. SYSTEM BOARD LAYOUT | 3-1 |
| 3.1 PT-5IV VER. 1.x | 3-1 |
| 4. HARDWARE SETUP | 4-1 |
| 4.1 UNPACKING | 4-1 |
| 4.2 HARDWARE CONFIGURATION | 4-1 |
| 4.2.1 DRAM INSTALLATION | 4-1 |
| 4.2.2 L2 CACHE MEMORY INSTALLATION | 4-2 |
| 4.2.3 CONNECTORS | 4-3 |
| 4.2.4 JUMPERS | 4-6 |
| 5. AWARD BIOS SETUP | 5-1 |
| 5.1 GETTING STARDED | 5-1 |
| 5.2 MAIN MENU | 5-2 |
| 5.3 CONTROL KEYS | 5-2 |
| 5.4 STANDARD CMOS SETUP | 5-3 |
| 5.5 BIOS FEATURES SETUP | 5-4 |
| 5.6 CHIPSET FEATURES SETUP | 5-5 |
| 5.7 POWER MANAGEMENT SETUP | 5-6 |
| 5.8 PNP/PCI CONFIGURATION | 5-7 |
| 5.9 INTEGRATED PERIPHERALS | 5-9 |
| THE OTHER SETUPS | 5-10 |

TRADEMARKS

All trademarks used in this manual are the property of their respective owners.

NOTE

The "LOAD SETUP DEFAULTS" function loads the default settings directly from BIOS default table, these default settings are the best-case values that should optimize system performance and increase system stability . This function will be necessary when you accept this system board, or the system CMOS data is corrupted.

By pressing "Enter" key, while "LOAD SETUP DEFAULTS" is highlighted, then presses "Y" and "Enter" key. the SETUP default values will be loaded. (Please refer to the Chapter 5 AWARD BIOS SETUP procedures in this manual.)

NOTICE

Information presented in this manual has been carefully checked for reliability; however, no responsibility is assumed for inaccuracies. The information contained in this manual is subject to change without notice.

1. INTRODUCTION

1.1 SYSTEM OVERVIEW

The **PT-5IV** Pentium PCI Local Bus system board is designed based on the Intel 82430VX PCIset system chipset and UMC (or SMC, ALI) I/O chipset, which built-in two channels PIO and Bus Master Enhanced PCI IDE port, one Floppy Disk control port, two high speed Serial ports (UARTs) and one multimode Parallel port and also supports IR and USB ports. It is designed to fit a high performance, Pentium 75 MHz to 200 MHz (ideally) based solution for high-end and true GREEN-PC computer systems.

This system board supports the Peripheral Component Interconnect (PCI) Local Bus standard (PCI Spec. Rev. 2.1 compliant). It not only breaks through the I/O bottlenecks of the traditional ISA main board, but also provides the performance needs for networking and multi-user environments.

1.2 FEATURES

The PT-5IV system board contains the following features:

- ☐ Pentium P54C/P54CT/P54CS/P55C, Cyrix 6x86 & AMD 5k86 based, PC/AT compatible system board with ISA Bus and PCI Local Bus.
- ☐ Supports the most part of "586" level CPUs designed by Intel, Cyrix and AMD.
- ☐ Built-in 2 sets voltage regulator circuit to support multi-spec. CPU I/O voltage (includes Standard, VR and VRE specification) and CPU CORE voltage (+2.5V DC and +2.8V DC).
- ☐ DRAM Memory : Supports fast page mode (FPM), Extended Data Out (EDO) and SDRAM (synchronous) memory.
- ☐ Cache Memory : Supports pipelined burst SRAMs. Cache memory size up to 512KB.
- ☐ BIOS : Supports Plug and Play BIOS.
- ☐ IDE ports : Supports two channels PIO and Bus Master Enhanced PCI IDE port, up to Mode 4 timing, and up to 22 MBytes/s transfer rates.
- ☐ I/O ports : Supports two high speed serial ports (UARTs), One multimode parallel port for standard (SPP), enhanced (EPP) and high speed (ECP) modes. One Floppy Disk Control port.
- ☐ IR Port (option) : Supports IR (Infrared Rays) functions. Both HPSIR and ASKIR are supported.
- ☐ USB Ports : Supports two Universal Serial Bus (USB) ports. (in the future)
- ☐ Software compatibility : MS-DOS, WindowsNT, OS2, XENIX, UNIX, NOVELL, CAD/CAM, Windows, Windows 95....etc.

2. SPECIFICATIONS

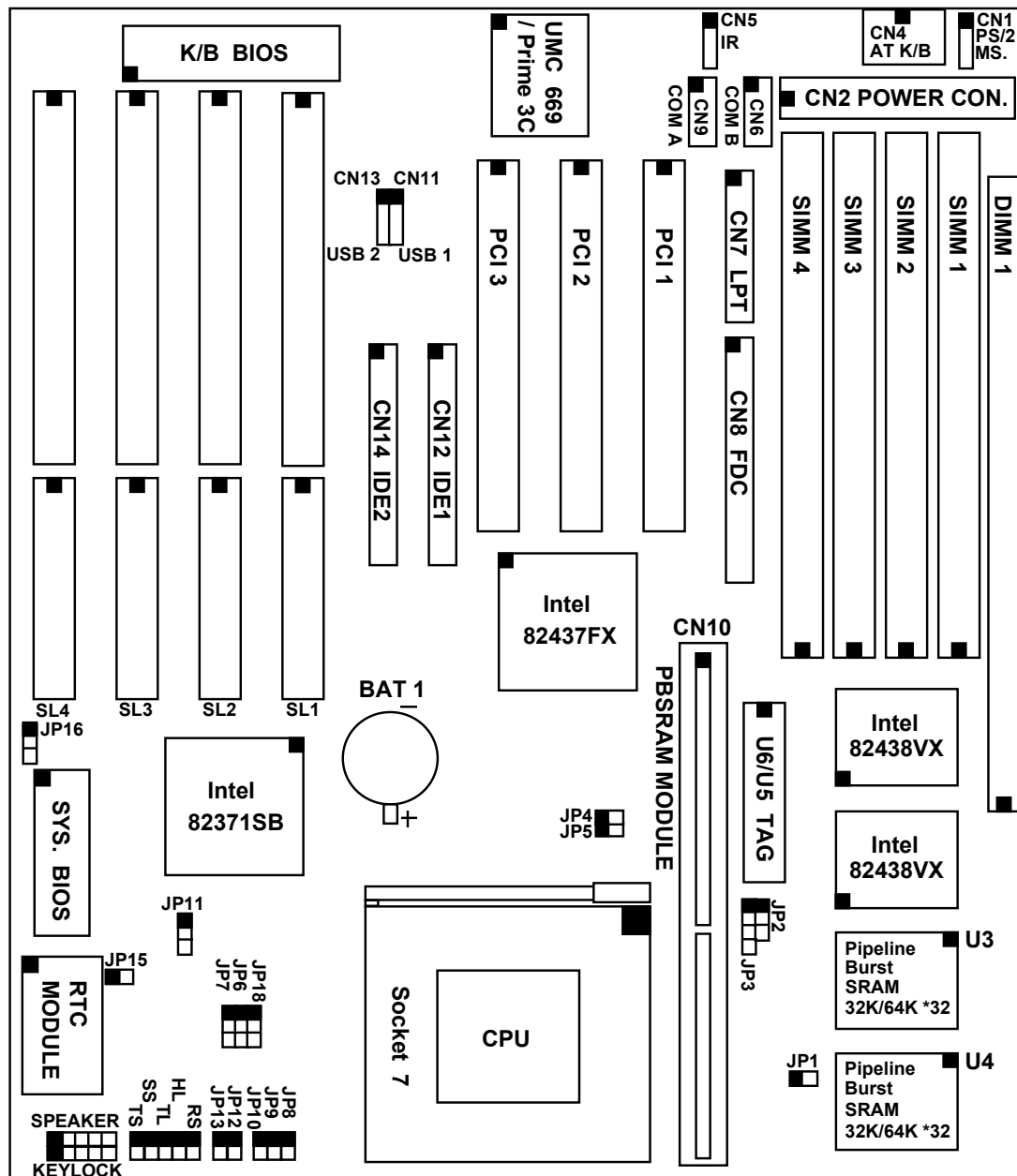
- ☐ **CPU**
Intel : Pentium processor and OverDrive processor (P54C/P54CS/P54CT/P55C/P55CT)
75/90/100/120/133/150/166 MHz and 180/200 MHz. (ideally)
Cyrix : 6x86-P120+(100MHz) / P133+(110MHz) / P150+(120MHz) / P166+(133MHz).
AMD : 5k86-P75(SSA/5-66)/ P75(SSA/5-75)/ P90(SSA/5-83)/ P90(SSA/5-90)/ P100(SSA/5-100)
- ☐ **CPU VCC**
(1). CPU I/O voltage : Supports Standard, VR and VRE specification.
(2). CPU CORE voltage : Supports "equal to CPU I/O voltage", "+2.5V " and "+2.8V" DC
- ☐ **WORD SIZE**
Data Path : 8-bit, 16-bit, 32-bit, 64-bit
- ☐ **PC System Chipset**
Intel 82430VX PciSet (82437VX, 82438VX, 82371SB)
- ☐ **I/O Chipset**
UMC UM8669F (or SMC FDC37C669, or ALI M5113).
- ☐ **System Clock**
50/55/60/66.6 MHz adjustable.
- ☐ **Memory**
DRAM : Two banks, each bank could be single or double sided, 8MB up to 128 MB.
Supports fast page mode (FPM), Extended Data Out (EDO) and SDRAM
(synchronous) memory. (Using modules 72-pin SIMM x 4 and 168-pin DIMM x 1).
5 Qword deep merging DRAM write buffer.
SRAM : Two banks, 256/512KB Direct-Mapped write back cache memory, supports on-
board 256KB or 512KB pipelined burst SRAM. One SRAM Module Slot for
upgrading to 512KB.
- ☐ **BIOS**
AWARD or AMI System BIOS. 128KBx8, Flash ROM. (Plug & Play BIOS)
- ☐ **Expansion Slots**
PCI Slots : 32-bit x 3 (All Master/Slave, PCI Spec. Rev. 2.1 Compliant)
ISA Slots : 16-bit x 4
- ☐ **IDE Ports**
Two channels PIO and Bus Master Enhanced PCI IDE port, maximum could be connected 4
IDE Hard Disk and ATAPI CD-ROM device.

- ☐ **Super I/O Ports**
 - 1. Two high speed NS16C550 compatible serial ports (UARTs).
 - 2. One parallel port, supports SPP/EPP/ECP mode.
 - 3. One Floppy Disk Control port.
- ☐ **IR Port** (option)
One HPSIR and ASKIR compatible IR transmission connector (5-pin).
- ☐ **Mouse and Keyboard**
Supports PS/2 mouse connector, PS/2 keyboard connector (option) and AT keyboard connector.
- ☐ **USB Ports** (in the future)
Two Universal Serial Bus (USB) ports.
- ☐ **DIMENSION**
 - Width & Length : 220 mm x 260 mm.
 - Height : 3/4 inches with components mounted, but without expansion boards and cables.
 - PCB Thickness : 4 layers, 0.05 inches normal.
 - Weight : 20 ounces.
- ☐ **ENVIRONMENT**
 - Operating Temperature : 10°C to 40°C. (50°F to 104°F)
 - Required Airflow : 50 linear feet per minute across 80486 CPU.
 - Storage Temperature : - 40°C to 70°C. (- 40°F to 158°F)
 - Humidity : 0 to 90% noncondensing.
 - Altitude : 0 to 10,000 feet.

3. SYSTEM BOARD LAYOUT

3.1 PT-5IV VER. 1.x

Explanation : All connectors, jumpers and components which marks by a black point on the corner means the pin-1 side of the connector, jumper and component.



4. HARDWARE SETUP

4.1 UNPACKING

The system board package should contain the following parts :

- ☐ The PT-5IV system board.
- ☐ OPERATION MANUAL.
- ☐ Cable set for IDE and I/O device.

4.2 HARDWARE CONFIGURATION

Before the system board is ready to operate, the hardware must be configured to allow for various functions within the system. To configure the PT-5IV system board is a simple task, only a few jumpers, connectors, cables and sockets needs to be selected and installed. (For the detailed locations of each component please refer to the "system board layout figure" which appears in page 3-1.)

4.2.1 DRAM INSTALLATION

The PT-5IV system board will support two banks main memory (bank0 and bank 1) on board, (using four 72-Pin SIMM socket, SIMM 1 - 4 and one 168-pin DIMM socket, DIMM 1) each bank could be single-sided or double-sided, 8MB up to 128 MB of local memory can be attained. Supports standard fast page mode (FPM), Extended Data Out (EDO) and synchronous (SDRAM) memory.

The usable DRAM modules are : *(Note : S = Single-sided , D = Double-sided)*

(1)FPM and EDO memory : 1MBx32(36)-S (**4MB**) , 1MBx32(36)-D (**8MB**),
2MBx32(36)-S (**8MB**) , 2MBx32(36)-D (**16MB**),
4MBx32(36)-S (**16MB**) , 4MBx32(36)-D (**32MB**).

(2)SDRAM memory : 1MBx64-S (**8MB**) , 2MBx64-D (**16MB**) , 4MBx64-S (**32MB**).

The speed of FPM DRAMs must be used 70ns or faster than 70ns, the speed of EDO DRAMs and SDRAMs must be used 60ns or faster than 60ns.

SIMMs' and DIMM's operating voltage :

(1)SIMM1 - SIMM4 : + 5V DC

(2)DIMM1 : +3.3V / +3.4V / +3.5V DC (depends on CPU I/O voltage, refer to page 4-8)

Bank can be populated in any order (bank 0 does not have to be populated before bank 1). Within any given bank, the SIMMs (DIMM) must be the same size. Among the two banks, SIMM (DIMM) densities can be mixed in any order. EDO, FPM and SDRAMs can be mixed between SIMMs (DIMM), a given SIMM (DIMM) must contain only one type of DRAM. When DRAM types are mixed each SIMM (DIMM) runs optimized for that particular type of DRAM.

There is no jumper needed for DRAM configuration, DRAMs' type and size will be detected by system BIOS automatically.

The following table provides the possible combinations for DRAM memory installation.

| Bank 0 | Bank 1 | |
|---------------------------------------|-----------------|--------------|
| SIMM1 and SIMM2 | SIMM3 and SIMM4 | DIMM1 |
| Single-sided or Double-sided or Empty | Single-sided | Empty |
| Single-sided or Double-sided or Empty | Double-sided | Empty |
| Single-sided or Double-sided or Empty | Empty | Single-sided |
| Single-sided or Double-sided or Empty | Empty | Double-sided |

Note : We strong recommend, Don't install any SIMM module in SIMM3 and SIMM4 when the DIMM1 is populated 3.3V SDRAM module.

4.2.2 L2 CACHE MEMORY INSTALLATION

The PT-5IV system board will support one or two bank(s) direct-mapped second level cache and provides either 256KB or 512KB cache memory using synchronous pipeline-burst SRAMs. (*Note that this system board does not support asynchronous or burst SRAMs for the cache memory*) Both Write Back and Write Through cache update policy are supported.

If the on-board cache memory size is 256KB, a COAST (Cache-On-A-Stick) module (256KB) will be use for upgrading the cache memory size from 256KB to 512KB. There is no jumper needed for end-user while upgrade cache memory size, just insert the COAST module into the SRAM module slot (CN10), then the cache memory size will be detected by system BIOS automatically.

Note : The COAST modules design must comply with Intel COAST (Cache-On-A-Stick) module specification revision 2.0 or later.

The following table lists the detailed combination about cache memory installation.

| Cache Size | Data SRAMs U3 ,U4 | Tag SRAMs U6 (or U5) | COAST SRAM module (CN10) |
|------------|----------------------|-------------------------|-----------------------------|
| 256 KB | 32KB x 32 | 8KB or 16KB or 32KB x 8 | Empty |
| 512 KB | 32KB x 32 | 8KB or 16KB or 32KB x 8 | 256 KB (with TAG SRAM) |
| 512 KB | 32KB x 32 | 16KB or 32KB x 8 | 256 KB (without TAG SRAM) |
| 512 KB | 64KB x 32 | 16KB or 32KB x 8 | Empty |

4.2.3 CONNECTORS

A connector is two or more pins that are used make connections to the system standard accessories (such as power, mouse, printer,...etc.) The following is a list of connectors on board, as well as descriptions of each individual connector.

- (A) BAT1 Non-Rechargeable battery (Using 3 Vlots Lithium battery : CR2032)

| <u>Pin #</u> | <u>Assignment</u> |
|--------------------------|-------------------|
| <input type="checkbox"/> | Battery Positive |
| <input type="checkbox"/> | Ground |

- (B) CN1 PS/2 Mouse converted connector

| <u>Pin #</u> | <u>Assignment</u> | <u>Pin #</u> | <u>Assignment</u> | <u>Pin #</u> | <u>Assignment</u> |
|--------------|-------------------|--------------|-------------------|--------------|-------------------|
| 1 | Mouse Data | 3 | Ground | 5 | Mouse Clock |
| 2 | No Connection | 4 | +5V DC | | |

- (C) CN2 Power connector

| <u>Pin #</u> | <u>Assignment</u> | <u>Pin #</u> | <u>Assignment</u> | <u>Pin #</u> | <u>Assignment</u> |
|--------------|-------------------|--------------|-------------------|--------------|-------------------|
| 1 | Power Good | 5 | Ground | 9 | -5V DC |
| 2 | +5V DC | 6 | Ground | 10 | +5V DC |
| 3 | +12V DC | 7 | Ground | 11 | +5V DC |
| 4 | -12V DC | 8 | Ground | 12 | +5V DC |

- (D) CN3 PS/2 Keyboard connector (option)

| <u>Pin #</u> | <u>Assignment</u> | <u>Pin #</u> | <u>Assignment</u> | <u>Pin #</u> | <u>Assignment</u> |
|--------------|-------------------|--------------|-------------------|--------------|-------------------|
| 1 | Keyboard Data | 3 | Ground | 5 | Keyboard Clock |
| 2 | No Connection | 4 | +5V DC | 6 | No Connection |

- (E) CN4 AT Keyboard connector

| <u>Pin #</u> | <u>Assignment</u> | <u>Pin #</u> | <u>Assignment</u> | <u>Pin #</u> | <u>Assignment</u> |
|--------------|-------------------|--------------|-------------------|--------------|-------------------|
| 1 | Keyboard Clock | 3 | No Connection | 5 | +5V DC |
| 2 | Keyboard Data | 4 | Ground | | |

- (F) CN5 IR (Infrared Rays) transmission connector

| <u>Pin #</u> | <u>Assignment</u> | <u>Pin #</u> | <u>Assignment</u> | <u>Pin #</u> | <u>Assignment</u> |
|--------------|-------------------|--------------|-------------------|--------------|-------------------|
| 1 | +5V DC | 3 | IR Receive | 5 | IR Transmit |
| 2 | No Connection | 4 | Ground | | |

- (G) CN6 COM B (Serial Port 2) connector
COM1/2/3/4, selected by BIOS setup, using IRQ3 or 4

| <u>Pin #</u> | <u>Assignment</u> | <u>Pin #</u> | <u>Assignment</u> |
|--------------|---------------------------|--------------|---------------------------|
| 1 | DCD (Data Carrier Detect) | 2 | RD (Received Data) |
| 3 | TD (Transmit Data) | 4 | DTR (Data Terminal Ready) |
| 5 | Ground | 6 | DSR (Data Set Ready) |
| 7 | RTS (Request To Send) | 8 | CTS (Clear To Send) |
| 9 | RI (Ring Indicator) | 10 | NC (No Connection) |

- (H) CN7 Parallel Port connector
(Supports SPP/EPP/ECP mode, selected by BIOS setup, using IRQ7 or IRQ5,
ECP using DMA channel 3 or 1)

| 1 14 | Pin # | Assignment | Pin # | Assignment |
|---|-------|------------|-------|----------------------|
| <input type="checkbox"/> <input type="checkbox"/> | 1 | STROBE- | 14 | AUTO FEED- |
| <input type="checkbox"/> <input type="checkbox"/> | 2 | Data Bit 0 | 15 | ERROR- |
| <input type="checkbox"/> <input type="checkbox"/> | 3 | Data Bit 1 | 16 | INIT- |
| <input type="checkbox"/> <input type="checkbox"/> | 4 | Data Bit 2 | 17 | SLCT IN- |
| <input type="checkbox"/> <input type="checkbox"/> | 5 | Data Bit 3 | 18 | Ground |
| <input type="checkbox"/> <input type="checkbox"/> | 6 | Data Bit 4 | 19 | Ground |
| <input type="checkbox"/> <input type="checkbox"/> | 7 | Data Bit 5 | 20 | Ground |
| <input type="checkbox"/> <input type="checkbox"/> | 8 | Data Bit 6 | 21 | Ground |
| <input type="checkbox"/> <input type="checkbox"/> | 9 | Data Bit 7 | 22 | Ground |
| <input type="checkbox"/> <input type="checkbox"/> | 10 | ACK- | 23 | Ground |
| <input type="checkbox"/> <input type="checkbox"/> | 11 | BUSY | 24 | Ground |
| <input type="checkbox"/> <input type="checkbox"/> | 12 | PE | 25 | Ground |
| <input type="checkbox"/> <input type="checkbox"/> | 13 | SLCT | 26 | N.C. (No Connection) |
| 13 26 | | | | |

- (I) CN8 Floppy Disk Control Port connector (Using IRQ6, DMA channel 2)

- (J) CN9 COM A (Serial Port 1) connector
COM1/2/3/4, selected by BIOS setup, using IRQ4 or 3
- | 1 2 | Pin # | Assignment | Pin # | Assignment |
|---|-------|---------------------------|-------|---------------------------|
| <input type="checkbox"/> <input type="checkbox"/> | 1 | DCD (Data Carrier Detect) | 2 | RD (Received Data) |
| <input type="checkbox"/> <input type="checkbox"/> | 3 | TD (Transmit Data) | 4 | DTR (Data Terminal Ready) |
| <input type="checkbox"/> <input type="checkbox"/> | 5 | Ground | 6 | DSR (Data Set Ready) |
| <input type="checkbox"/> <input type="checkbox"/> | 7 | RTS (Request To Send) | 8 | CTS (Clear To Send) |
| <input type="checkbox"/> <input type="checkbox"/> | 9 | RI (Ring Indicator) | 10 | NC (No Connection) |
| 9 10 | | | | |

- (K) CN10 Pipeline-burst SRAM (COAST) module slot

- (L) CN11 USB 1 (Universal Serial Bus port1) connector

- (M) CN12 IDE 1 connector (Primary IDE Port, using IRQ14)

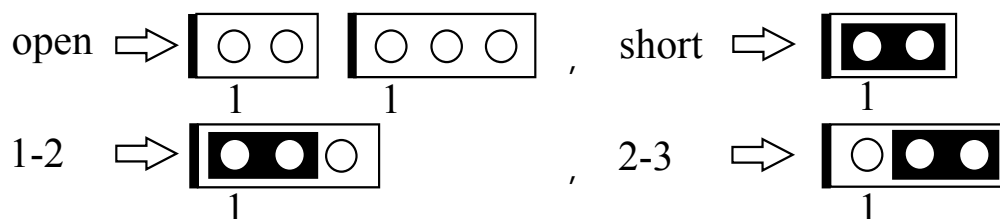
- (N) CN13 USB 2 (Universal Serial Bus port2) connector

- (O) CN14 IDE 2 connector (Secondary IDE Port, using MIRQ0)

- (P) RS Reset Button connector
- | Pin # | Assignment | Pin1&2 | Function |
|-------|---------------|--------|--------------|
| 1 | Reset Control | Open | No action |
| 2 | Ground | Short | System Reset |

- (Q) HL IDE HDD LED connector
- | <u>Pin #</u> | <u>Assignment</u> |
|--------------|-------------------|
| 1 | Pullup (+5V DC) |
| 2 | Signal Pin |
- (R) TL Turbo LED connector
- | <u>Pin #</u> | <u>Assignment</u> |
|--------------|-------------------|
| 1 | Pullup (+5V DC) |
| 2 | Signal Pin |
- (S) SS External SMI button connector
- | <u>Pin #</u> | <u>Assignment</u> | <u>Pin1&2</u> | <u>Function</u> |
|--------------|-------------------|-------------------|--------------------------|
| 1 | SMI Control | Open | For normal operation |
| 2 | Ground | Short | To get into Suspend mode |
- (T) TS Turbo Switch connector (This function is reserved)
- | <u>Pin #</u> | <u>Assignment</u> | <u>Pin1&2</u> | <u>Function</u> |
|--------------|-------------------|-------------------|-----------------|
| 1 | Turbo Control | Open | Turbo |
| 2 | Ground | Short | Normal |
- (U) SPEAKER Speaker connector
- | <u>Pin #</u> | <u>Assignment</u> | <u>Pin #</u> | <u>Assignment</u> |
|--------------|-------------------|--------------|---------------------|
| 1 | +5V DC | 4 | Speaker Data Signal |
| 2 | No Connection | 5 | No Connection |
| 3 | No Connection | | |
- (V) KEY LOCK Front Panel Power LED & Key-Lock connector
- | <u>Pin #</u> | <u>Assignment</u> |
|--------------|-------------------------------|
| 1 | Pullup (+5V DC for Power LED) |
| 2 | No Connection |
| 3 | Ground |
| 4 | Keyboard Lock |
| 5 | Ground |

Explanation : (For next section : JUMPERS)



4.2.4 JUMPERS

A jumper is two, three or more pins which may or may not be covered by a plastic connector plug (mini-jumper). A jumper is used to select different system options. ***Please make sure all jumpers at correct position before this system board used.***

(A-1) JP4, JP5, JP12, JP13 CPU type selection (**For PT-5IV VER. 1.x**)

(1) INTEL Pentium / Pentium-MMX CPUs (**For PT-5IV VER. 1.x**)

| CPU Type | JP4 | JP5 | JP12 | JP13 | Remark |
|-----------------------|-------|-------|-------|-------|--------|
| 80502-75 | short | short | open | open | |
| 80502-90 | short | open | open | open | |
| 80502-100 | open | open | open | open | |
| 80502-120 | short | open | short | open | |
| 80502-133 | open | open | short | open | |
| 80502-150 | short | open | short | short | |
| 80502-166 / 80503-166 | open | open | short | short | |
| 80502-180 | short | open | open | short | |
| 80502-200 / 80503-200 | open | open | open | short | |
| 80503-233 | open | open | open | open | |

(2) Cyrix 6x86 / 6x86L CPUs (**For PT-5IV VER. 1.x**)

| CPU Type | JP4 | JP5 | JP12 | JP13 | Remark |
|---------------------|-------|-------|-------|------|--------|
| 6x86 / 6x86L -P120+ | short | short | short | open | |
| 6x86 / 6x86L -P133+ | open | short | short | open | |
| 6x86 / 6x86L -P150+ | short | open | short | open | |
| 6x86 / 6x86L -P166+ | open | open | short | open | |

(3) AMD K5 CPUs (**For PT-5IV VER. 1.x**)

| CPU Type | JP4 | JP5 | JP12 | JP13 | Remark |
|--------------|-------|-------|-------|-------|--------|
| AMD-K5-PR75 | short | short | open | open | |
| AMD-K5-PR90 | short | open | open | open | |
| AMD-K5-PR100 | open | open | open | open | |
| AMD-K5-PR120 | short | open | open | open | |
| AMD-K5-PR133 | open | open | open | open | |
| AMD-K5-PR150 | short | open | short | short | |
| AMD-K5-PR166 | open | open | short | short | |

(B) JP6-JP11, JP18 CPU operating voltage selection

Note : (1). For the detailed CPU-VCC requirement, please inquire of your CPU supplier.
 (2). In PT-5IV VER. 1.2, the JP18 is inexistent, you could skip it.

| CPU VCC | | JP6 | JP7 | JP8 | JP9 | JP10 | JP11 | JP18 | Remark |
|-------------|--------------|-----|-----|-------|-------|-------|------|------|--------|
| I/O voltage | CORE voltage | | | | | | | | |
| + 3.3 V | + 3.3 V | 2-3 | 2-3 | short | open | open | x | 2-3 | * |
| + 3.4 V | + 3.4 V | 2-3 | 2-3 | open | short | open | x | 2-3 | |
| + 3.5 V | + 3.5 V | 2-3 | 2-3 | open | open | short | x | 2-3 | |
| + 3.3 V | + 2.5 V | 1-2 | 1-2 | short | open | open | 1-2 | 1-2 | ** |
| + 3.4 V | + 2.5 V | 1-2 | 1-2 | open | short | open | 1-2 | 1-2 | |
| + 3.5 V | + 2.5 V | 1-2 | 1-2 | open | open | short | 1-2 | 1-2 | |
| + 3.3 V | + 2.8 V | 1-2 | 1-2 | short | open | open | 2-3 | 1-2 | *** |
| + 3.4 V | + 2.8 V | 1-2 | 1-2 | open | short | open | 2-3 | 1-2 | |
| + 3.5 V | + 2.8 V | 1-2 | 1-2 | open | open | short | 2-3 | 1-2 | |

Remark :

x : Don't care

* : For the single-VCC required CPUs. (e.g. Intel P54C, Cyrix 6x86, AMD-SSA/5-xxAB?, AMD-SSA/5-xxAC?, AMD-SSA/5-xxAF? ... etc.)

** : For a part of the dual-VCC required CPUs.
 (e.g. Intel P55C-166, Cyrix M2, AMD-SSA/5-xxAK? ... etc.)

*** : For a part of the dual-VCC required CPUs.
 (e.g. Intel P55C-200, Cyrix M2, AMD-SSA/5-xxAH?, AMD-SSA/5-xxAJ? ... etc.)

(C) JP15 Clear CMOS button

Pin # Function

open Normal operation

short Clear CMOS (*Note : Don't forget to open this jumper after 2-3 seconds*)

Note : Depends on different brand-name of RTC IC (U27 or U28), there are two times to clear CMOS, the following is a list for reference :

(1) while power-on : BENCHMARQ / bq3287AMT, SGS / M48T86,

(2) while power-off : VIA / VT82885N, ODIN / OEC12C885 / OEC12C887A,
 DALLAS / DS12887A.

(D) JP16 ROM BIOS Selection

Pin # Function

1-2 For +5V FLASH ROM, EPROM

2-3 For +12V FLASH ROM

(E) JP1-JP3, JP14 (Reserved)

5. AWARD BIOS SETUP

5.1 GETTING STARTED

When the system is first powered on or reset, the BIOS will enter the Power-On Self Test routines (POST : Display a copyright message on the screen followed by a diagnostics and initialization procedure.) (If an EGA or VGA card is installed, the copyright message of the video card maybe displayed on the screen first.) The BIOS will indicate any error or malfunction by a series of beeps or display the error message on screen.

Normally, the simulate figure 5-1 will display on the screen when the system is powered on.

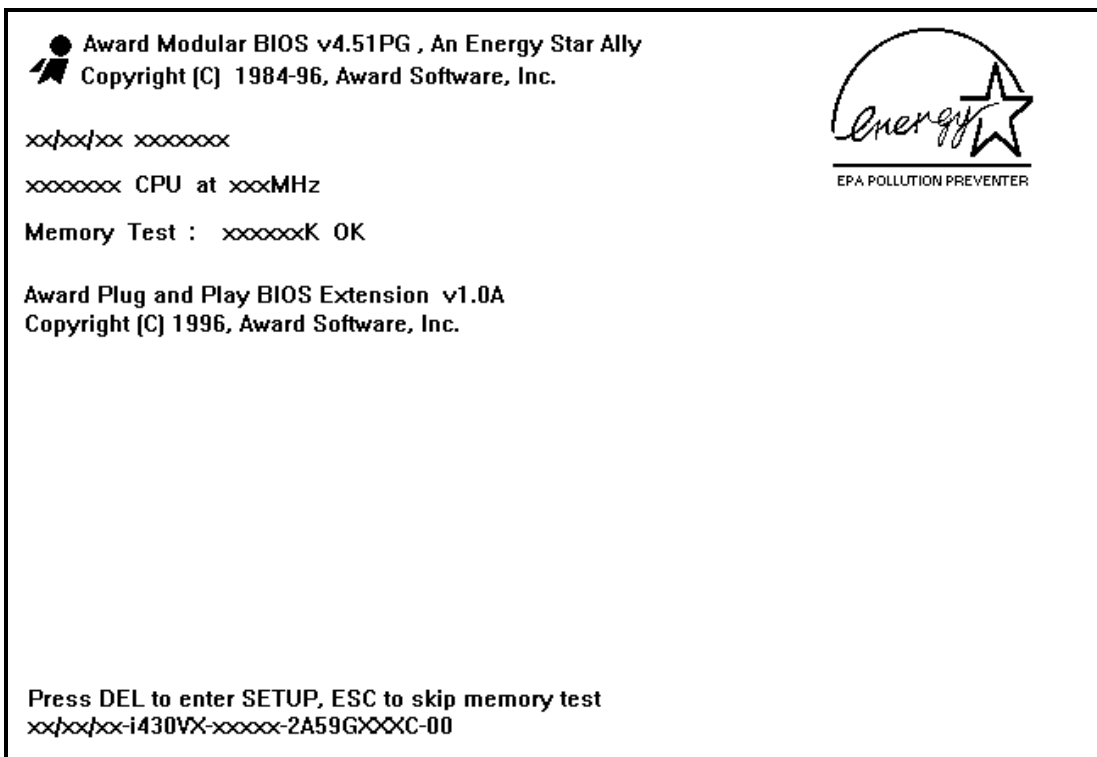


Fig. 5-1 Initial Power-On screen.

After the POST routines are completed, the following message appears :

" Press **DEL** to enter SETUP "

To execute the Award BIOS Setup program, press **DEL** key. The simulate screen in figure 5-2 MAIN MENU will be displayed at this time.

5.2 MAIN MENU

ROM PCI/ISA BIOS (2A59GXXX)
CMOS SETUP UTILITY
AWARD SOFTWARE, INC.

| | |
|---|--|
| STANDARD CMOS SETUP BIOS FEATURES SETUP CHIPSET FEATURES SETUP POWER MANAGEMENT SETUP PNP/PCI CONFIGURATION INTEGRATED PERIPHERALS LOAD SETUP DEFAULTS | SUPERVISOR PASSWORD USER PASSWORD IDE HDD AUTO DETECTION HDD LOW LEVEL FORMAT SAVE & EXIT SETUP EXIT WITHOUT SAVING |
| ESC : Quit F10 : Save & Exit Setup | |
| <div> <div>□□□□ : Select Item</div> <div>(Shift)F2 : Change Color</div> </div> | |
| Time, Date, Hard Disk Type ... | |

Fig. 5-2 CMOS SETUP MAIN MENU screen.

5.3 CONTROL KEYS

Listed below is an explanation of the keys displayed at the bottom of the screens accessed through the BIOS SETUP program :

| | |
|------------------------|--|
| Arrow Keys | : Use the arrow keys to move the cursor to the desired item. |
| Enter | : To Select the desired item. |
| F1 | : Display the help screen for the selected feature. |
| (Shift)F2 | : To change the screen color, total 16 colors. |
| ESC | : Exit to the previous screen. |
| PgUp(-)/PgDn(+) | : To modify the default value of the options for the highlighted feature. |
| F5 | : Retrieves the previous CMOS values from CMOS, only for the current option page setup menu. |
| F6 | : Loads the BIOS default values from BIOS default table, only for the current option page setup menu. |
| F7 | : Loads the SETUP default values from BIOS default table, only for the current option page setup menu. |
| F10 | : Save all changes made to CMOS RAM, only for the MAIN MENU. |

The following pages will show the simulate screens of CMOS SETUP, each figure contains the setup items and the default settings of them. Below each figure may or may not be contained a lists of function description for commonly used settings. For the other settings' function description you needed, please feel free to contact with your supplier.

5.4 STANDARD CMOS SETUP

ROM PCI/ISA BIOS (2A59GXXX) STANDARD CMOS SETUP AWARD SOFTWARE, INC.

| Date (mm : dd : yy) : Fri, May 31 1996 | | | | | | | | |
|--|------|------|---|---|---------|--------------------|--------|------|
| Time (hh : mm : ss) : 11 : 33 : 55 | | | | | | | | |
| HARD DISKS | TYPE | SIZE | CYLS | HEAD | PRECOMP | LANDZ | SECTOR | MODE |
| Primary Master | Auto | 0 | 0 | 0 | 0 | 0 | 0 | Auto |
| Primary Slave | Auto | 0 | 0 | 0 | 0 | 0 | 0 | Auto |
| Secondary Master | Auto | 0 | 0 | 0 | 0 | 0 | 0 | Auto |
| Secondary Slave | Auto | 0 | 0 | 0 | 0 | 0 | 0 | Auto |
| Drive A : 1.44M, 3.5 in. | | | | Base Memory : 640 K Extended Memory : xxxxxx K Other Memory : xxxxxx K <hr/> Total Memory : xxxxxx K | | | | |
| Drive B : None | | | | | | | | |
| Video : EGA/VGA | | | | | | | | |
| Halt On : All Errors | | | | | | | | |
| ESC : Quit | | | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> : Select Item | | | PU/PD/+/- : Modify | | |
| F1 : Help | | | (Shift)F2 : Change Color | | | | | |

Fig. 5-3 STANDARD CMOS SETUP screen.

MODE :

For IDE hard disks, this BIOS provides three modes to support both normal size IDE hard disks and also disks size larger the 528MB:

- ☐NORMAL : For IDE hard disks size smaller then 528MB.
- ☐LBA : For IDE hard disks size larger then 528MB and up to 8.4GB (Giga Bytes) that use Logic Block Addressing (LBA) mode.
- ☐Large : For IDE hard disks size larger then 528MB that do not use LBA mode. Large mode is a new specifition which may not be fully supported by all operation systems. Now it can only be used with the MS-DOS and is uncommon.

Note : Some OSes (like SCO-UNIX) must use "NORMAL" for installation.

5.5 BIOS FEATURES SETUP

ROM PCI/ISA BIOS (2A59GXXX)
 BIOS FEATURES SETUP
 AWARD SOFTWARE, INC.

| | | | |
|----------------------------|------------|-------------------------|---|
| Virus Warning | : Disabled | Video BIOS Shadow | : Enabled |
| CPU Internal Cache | : Enabled | C8000-CBFFF Shadow | : Disabled |
| External Cache | : Enabled | CC000-CFFFF Shadow | : Disabled |
| Quick Power On Self Test | : Enabled | D0000-D3FFF Shadow | : Disabled |
| Boot Sequence | : A, C | D4000-D7FFF Shadow | : Disabled |
| Swap Floppy Drive | : Disabled | D8000-DBFFF Shadow | : Disabled |
| Boot Up Floppy Seek | : Enabled | DC000-DFFFF Shadow | : Disabled |
| Boot Up NumLock Status | : On | | |
| Boot Up System Speed | : High | | |
| Gate A20 Option | : Fast | | |
| Typematic Rate Setting | : Disabled | | |
| Typematic Rate (Chars/Sec) | : 6 | | |
| Typematic Delay (Msec) | : 250 | | |
| Security Option | : Setup | ESC : Quit | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> : Select Item |
| PCI/VGA Palette Snoop | : Disabled | F1 : Help | PU/PD/+/- : Modify |
| OS Select For DRAM > 64MB | : Non-OS2 | F5 : Old Values | (Shift)F2 : Color |
| | | F6 : Load BIOS Default | |
| | | F7 : Load Setup Default | |

Fig. 5-4 BIOS FEATURES SETUP screen.

Virus Warning :

This feature flashes on the screen. During and after the system boots up, any attempt to write to the boot sector or partition table of the hard disk drive will halt the system and an error message will appear, in the mean time, you can run anti-virus program to locate the problem. Default values is "Disabled"

Enabled : Activate automatically when the system boots up causing a warning message to appear when anything attempts to access the boot sector or hard disk partition table.

Disabled : No warning message to appear when anything attempts to access the boot sector or hard disk partition table.

CPU Internal Cache :

This option enables CPU's internal (L1) cache memory. If you want to use the internal (L1) cache memory and external (L2) cache memory, this option must be enabled.

External Cache :

This option enables L2 (secondary) external cache memory. If none external cache memory on board you must set this option to "disabled", otherwise, you can select enabled or disabled.

5.6 CHIPSET FEATURES SETUP

ROM PCI/ISA BIOS (2A59GXXX)
 CHIPSET FEATURES SETUP
 AWARD SOFTWARE, INC.

| | | |
|---------------------------|-------------|--|
| Auto Configuration | : Enabled | |
| DRAM Timing | : 70 ns | |
| DRAM RAS# Precharge Time | : 4 | |
| DRAM R/W Leadoff Timing | : 6 | |
| Fast RAS To CAS Delay | : 3 | |
| DRAM Read Burst (EDO/FP) | : x222/x333 | |
| DRAM Write Burst Timing | : x333 | |
| Fast NA to RAS# Delay CLK | : 1 | |
| Fast EDO Path Select | : Disabled | |
| Refresh RAS# Assertion | : 5 CLKs | |
| ISA Clock | : PCICLK/4 | |
| System BIOS Cacheable | : Disabled | |
| Video BIOS Cacheable | : Disabled | |
| 8 Bit I/O Recovery Time | : 1 | ESC : Quit <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> : Select Item |
| 16 Bit I/O Recovery Time | : 1 | F1 : Help PU/PD/+/- : Modify |
| Memory Hole At 15M-16M | : Disabled | F5 : Old Values (Shift)F2 : Color |
| Peer Concurrency | : Enabled | F6 : Load BIOS Default |
| | | F7 : Load Setup Default |

Fig. 5-5 CHIPSET FEATURES SETUP screen.

WARNING : *The CHIPSET FEATURES SETUP in this screen are provided so that technical professionals can modify the Chipset to suit their requirement. If you are not a technical engineer, do not use this program !*

Auto Configuration :

When "Enabled", this parameter automatically enters and locks some of the optimum values for the chipset and CPU. Otherwise, this parameter allows the values of these parameters could be changed.

DRAM Timing :

When "Auto Configuration" is "Enabled", this parameter provides two suit of the optimum values for the chipset and CPU, depends on the DRAMs' speed, you can select "70 ns" or "60 ns", but the first value maybe caused your system more stable.

5.7 POWER MANAGEMENT SETUP

ROM PCI/ISA BIOS (2A59GXXX)
POWER MANAGEMENT SETUP
AWARD SOFTWARE, INC.

| | | | |
|--|----------------|----------------------------------|---|
| Power Management | : User Define | ** Power Down & Resume Events ** | |
| PM Control by APM | : Yes | IRQ 3 (COM 2) | : ON |
| Video Off Method | : Blank Screen | IRQ 4 (COM 1) | : ON |
| MODEM Use IRQ | : 3 | IRQ 5 (LPT 2) | : ON |
| | | IRQ 6 (Floppy Disk) | : ON |
| Doze Mode | : 20 Min | IRQ 7 (LPT 1) | : ON |
| Standby Mode | : 20 Min | IRQ 8 (RTC Alarm) | : OFF |
| Suspend Mode | : 20 Min | IRQ 9 (IRQ2 Redir) | : ON |
| HDD Power Down | : Disable | IRQ 10 (Reserved) | : OFF |
| | | IRQ 11 (Reserved) | : ON |
| ** Wake Up Events In Doze & Standby ** | | IRQ 12 (PS/2 Mouse) | : ON |
| IRQ3 (Wake-Up Event) | : ON | IRQ 13 (Coprocessor) | : ON |
| IRQ4 (Wake-Up Event) | : ON | IRQ 14 (Hard Disk) | : ON |
| IRQ8 (Wake-Up Event) | : OFF | IRQ 15 (Reserved) | : OFF |
| IRQ12 (Wake-Up Event) | : ON | | |
| | | ESC : Quit | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> : Select Item |
| | | F1 : Help | PU/PD/+/- : Modify |
| | | F5 : Old Values | (Shift)F2 : Color |
| | | F6 : Load BIOS Default | |
| | | F7 : Load Setup Default | |

Fig. 5-6 POWER MANAGEMENT SETUP screen.

WARNING : The POWER MANAGEMENT SETUP in this screen are provided so that technical professionals can modify the Chipset to suit their requirement. If you are not a technical engineer, do not use this program !

Power Management :

This setting controls the Power Management functions. "User Define" allows the values of all parameters could be modified. "Min Saving" and "Max Saving" fixed the values of four parameters, including "Doze Mode", "Standby Mode", "Suspend Mode" and "HDD Power Down".

"Disable" disabled all Power Management functions. Default is "User Define".

5.8 PNP/PCI CONFIGURATION

ROM PCI / ISA BIOS (2A59GXXX)
PNP/PCI CONFIGURATION
AWARD SOFTWARE, INC.

| | | | |
|--------------------------|---------------|-------------------------|---|
| Resources Controlled By | : Auto | PCI IRQ Activated By | : Level |
| Reset Configuration Data | : Disabled | PCI IDE IRQ Map To | : PCI-AUTO |
| | | Primary IDE INT# | : A |
| | | Secondary IDE INT# | : B |
| IRQ-3 assigned to | : Legacy ISA | | |
| IRQ-4 assigned to | : Legacy ISA | | |
| IRQ-5 assigned to | : PCI/ISA PnP | | |
| IRQ-7 assigned to | : PCI/ISA PnP | | |
| IRQ-9 assigned to | : PCI/ISA PnP | | |
| IRQ-10 assigned to | : PCI/ISA PnP | | |
| IRQ-11 assigned to | : PCI/ISA PnP | | |
| IRQ-12 assigned to | : PCI/ISA PnP | | |
| IRQ-14 assigned to | : PCI/ISA PnP | | |
| IRQ-15 assigned to | : PCI/ISA PnP | | |
| DMA-0 assigned to | : PCI/ISA PnP | | |
| DMA-1 assigned to | : PCI/ISA PnP | | |
| DMA-3 assigned to | : PCI/ISA PnP | ESC : Quit | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> : Select Item |
| DMA-5 assigned to | : PCI/ISA PnP | F1 : Help | PU/PD/+/- : Modify |
| DMA-6 assigned to | : PCI/ISA PnP | F5 : Old Values | (Shift)F2 : Color |
| DMA-7 assigned to | : PCI/ISA PnP | F6 : Load BIOS Default | |
| | | F7 : Load Setup Default | |

Fig. 5-7 PNP/PCI CONFIGURATION setup screen.

WARNING : The PNP/PCI CONFIGURATION in this screen are provided so that technical professionals can modify the Resources Configuration to suit their requirement. If you are not a technical engineer, do not use this program !

Resources Controlled by :

Manual : The system BIOS will not reference the ESCD for IRQ & DMA informations. Instead, it will reference the items in this setup menu for assigning IRQ & DMA, but for I/O and Memory space the system BIOS still refer to the ESCD.

Atuo : The system BIOS will reference the ESCD all legacy informations.

Reset Configuration Data :

Disabled : The system BIOS will do nothing.

Enabled : The system BIOS will clear/reset the ESCD during "POST". After clearing the ESCD, the system BIOS will then change this item's value back to "Disable", otherwise, the ESCD will become useless.

IRQ# / DMA# assigned to :

Legacy : The system BIOS will skip never assign this specified IRQ/DMA resource to PCI or ISA ISA PnP devices.

PCI/ISA : All items set to this value will make the specified IRQ/DMA have a chance to be PnP assigned to PCI or ISA PnP devices.

PCI IRQ Activated By :

This option tells the system board chipset the IRQ signals input is Level or Edge trigger.

PCI IDE IRQ Map To : (for off-board PCI IDE cards)

PCI-AUTO : The BIOS will scan for PCI IDE devices and determine the location of the PCI IDE device, then assign IRQ 14 for primary IDE INT#, and assign IRQ 15 for secondary IDE INT#.

PCI-SLOT1 : For the specified slot, the BIOS will assign IRQ 14 for primary IDE INT#, and assign to IRQ 15 for secondary IDE INT#.

PCI-SLOT4

ISA : The BIOS will not assign any IRQs even if PCI IDE card is found. Because some IDE cards connect the IRQ 14 and 15 directly from ISA slot thru a card. (This card is called Legacy Header)

Note : No matter the item "Resources Controlled By" is set to "Manual" or "Auto", the system BIOS assign IRQs to PCI devices from high to low. For ISA PnP devices, the sequence is from low to high. IRQ 12 is always the last one available for PCI/PnP due to IRQ 12 is always reserves for the PS/2 mouse.

Explanation for proper nouns :**PnP device :**

- ☐ Device that has Plug & Play compatibility. That means it can request for DMA, IRQ, I/O and Memory from the PnP BIOS and all these requests can be relocatable. In other words, these devices does not utilized any fixed resources.
- ☐ All PCI devices and all ISA PnP devices are PnP devices.

Legacy device :

- ☐ A legacy device is a device that all its resources are fixed by hardware (or selected by jumpers).
- ☐ All ISA Non-PnP devices are legacy device.

Extended System Configuration Data (ESCD) :

- ☐ A media between the user and the system BIOS for passing the legacy devices informations. These informations are stored in the onboard NVRAM (flash ROM).

5.9 INTEGRATED PERIPHERALS

There are maybe a few different setup items on this screen while using different I/O chipset, the following figure is an example. For the different setup items, if you still want to know, please feel free to contact with your supplier.

ROM PCI/ISA BIOS (2A59GXXX)
INTEGRATED PERIPHERALS
AWARD SOFTWARE, INC.

| | | |
|---------------------------|-------------|---|
| IDE HDD Block Mode | : Enabled | |
| IDE Primary Master PIO | : Auto | |
| IDE Primary Slave PIO | : Auto | |
| IDE Secondary Master PIO | : Auto | |
| IDE Secondary Slave PIO | : Auto | |
| On-Chip Primary PCI IDE | : Enabled | |
| On-Chip Secondary PCI IDE | : Enabled | |
| PCI Slot IDE 2nd Channel | : Enabled | |
| USB Controller | : Disabled | |
| Onboard FDD Controller | : Enabled | |
| Onboard Serial Port 1 | : COM1/3F8 | |
| Onboard Serial Port 2 | : COM2/2F8 | |
| Infra Red (IR) Function | : Disabled | |
| Onboard Parallel Port | : 378H/IRQ7 | |
| Onboard Parallel Mode | : SPP | |
| IR Transfer Mode | : Half-Dup | |
| | | ESC : Quit <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> : Select Item F1 : Help PU/PD/+/- : Modify F5 : Old Values (Shift)F2 : Color F6 : Load BIOS Default F7 : Load Setup Default |

Fig. 5-8 INTEGRATED PERIPHERALS setup screen.

WARNING : *The INTEGRATED PERIPHERALS in this screen are provided so that technical professionals can modify the Chipset to suit their requirement. If you are not a technical engineer, do not use this program !*

IDE HDD Block Mode :

This feature enhances hard disk performance, making multi-sector transfers instead of one sector per transfer. Most IDE drives, except the very early designs can use this feature. Default is "Enabled".

Infra Red (IR) Function :

This setting determines the IR port (CN 5) function mode. Supports both HPSIR and ASKIR.

Onboard Parallel Mode :

This setting determines the onboard parallel port (CN 7) transmission mode. Supports either SPP, EPP, ECP or ECP+EPP.

IR Transfer Mode :

This setting determines the IR port (CN 5) transmission mode is Half-Duplex or Full-Duplex.

5.10 LOAD SETUP DEFAULTS

This option loads the SETUP default values from BIOS default table. By pressing "Enter" key, while "LOAD SETUP DEFAULTS" is highlighted, then presses "Y" and "Enter" key. the SETUP default values will be loaded. The SETUP default settings are the best-case values that should optimize system performance and increase system stability. If CMOS RAM is corrupted, the SETUP DEFAULTS settings are loaded automatically.

5.11 SUPERVISOR PASSWORD / USER PASSWORD

Type the Password and press "Enter", then repeat. Enters up to eight alphanumeric characters. By pressing "Enter" key twice, without any alphanumeric character enters, the PASSWORD will be disabled.

5.12 IDE HDD AUTO DETECTION

By pressing "Enter" key, while "IDE HDD AUTO DETECTION" is highlighted causes the system to attempt to detect the type of hard disk. If successful, then presses "Y" (or 1, 2, ...) and "Enter" key, it fills in the remaining fields on this menu and the correlated fields in the STANDARD CMOS SETUP menu.

5.13 HDD LOW LEVEL FORMAT

This option provides an utility program for IDE HDD Low Level Format. Performing the Hard Disk Format will destroy any data on the Hard Disk. Back up the Hard Disk(s) before actually performing of these routines.

*Note : These routines are not valid for a **SCSI** Disk Drive.*

5.14 SAVE & EXIT SETUP

This option saves all setup values to CMOS RAM & EXIT SETUP routine, by moving the cursor to "SAVE & EXIT SETUP" and pressing "Enter" key, then types "Y" and "Enter" key, the values will be saved, the setup program will be terminated and the system will be reboot.

5.15 EXIT WITHOUT SAVING

This option exits setup routine without saving any changed values to CMOS RAM, by moving the cursor to "EXIT WITHOUT SAVING" and pressing "Enter" key, then types "Y" and "Enter" key, the setup program will be terminated and the system will be reboot.

Printed in Taiwan
Edition : 2.0