# GA - 586SVX

# USER'S MANUAL

## PCI - ISA SOLUTION

**PENTIUMä PCI - ISA BUS MAINBOARD**

**REV.1.1 Fourth Edition**

## Who need 82430SVX?

1. If you want to get the best performance.

   (Because more buffers & Quick DRAM Timing is supported.)

2. If you need a USB ports for C&C application.

   (Because 2 USB ports will be ready in the end of Q2/96".)

## Why do you need GA-586SVX 82430SVX motherboard?

1. Because it is the best performance motherboard. (See next page) We have compared GA-586SVX with PC Magazine EDITOR choice-system.

2. Just plug a 256KB Pipeline cache module and you can get cache size upto 512KB easily. No jumper setting needed.

   Others don't, because they don't have an upgrade cache module. Or they have to change jumper setting to 512KB.

3. No risk for Intel P55CT CPU upgrade because GA-586SVX will auto detect P55CT and support right operation voltage.

   Others don't, because they need an EXTRA VRM module or jumper setting for P55CT CPU upgrade.

4. DIP switch setting is supported. You don't have to worry any jumper shunter missed.

   Others don't, because they have jumpers on board.

## I. PERFORMANCE

**Gateway P5-166 XL (P/166) / SAG STF 166(P/166):**

These two systems' score are according to PC Magazine February 20, 1996. Page 146-148.

**GA-586SVX (P166):**

The system tested with 1.2GB hard disk drive, 4 x CD-ROM, and 16MB of EDO RAM. Using the graphics driver provided from Windows95 in 1024 by 768 resolution with 256 colors, small font, and a refresh rate 72Hz. Also we defragmented hard disk before each test for Windows95 manage virtual memory setting.

Hardware Configuration:

- CPU Intel 166 MHz
- RAM 8MB 2pcs. Total 16 MB (Panasonic EUXSR08XX00E)
- Cache size 256 KB Pipeline Burst SRAM (UMC UM61L3232AF-7) 2 pcs.
  512 KB Pipeline Burst SRAM (UMC UM61L3232AF-7) 4 pcs.
- DISPLAY Matrox MGA Millennium Power Desk
- STORAGE Quantum Fireball 1280AT
- O.S. Windows 95

| | O.S. | Cache size | VGA | WINSTONE96 |
|---|---|---|---|---|
| Gateway P5-166 XL(P/166) | Windows95 | 256KB | Matrox MGA Impression | **75** |
| SAG STF 166(P/166) | Windows95 | 512KB | Image 128#9 | **76** |
| GA-586SVX(P/166) | Windows95 | 256KB | Matrox MGA Millennium Power Desk | **79.6** |
| GA-586SVX(P/166) | Windows95 | 512KB | Matrox MGA Millennium Power Desk | **80.6** |

## II. Quick Installation Guide:

| Intel CPU | SW1 | SW2 | SW3 | SW4 |
|---|---|---|---|---|
| 1. Pentium 75 MHz | OFF | OFF | ON | ON |
| 2. Pentium 90 MHz | OFF | OFF | OFF | ON |
| 3. Pentium 100 MHz | OFF | OFF | OFF | OFF |
| 4. Pentium 120 MHz | ON | OFF | OFF | ON |
| 5. Pentium 133 MHz | ON | OFF | OFF | OFF |
| 6. Pentium 150 MHz/P55C-150MHz | ON | ON | OFF | ON |
| 7. Pentium 166 MHz/P55C-166MHz | ON | ON | OFF | OFF |
| 8. Pentium 180 MHz | OFF | ON | OFF | ON |
| 9. Pentium 200 MHz/P55C-200MHz | OFF | ON | OFF | OFF |
| 10. P54CT-125 MHz | ON | ON | ON | ON |
| 11. P54CT-150 MHz | ON | ON | OFF | ON |
| 12. P54CT-166 MHz | ON | ON | OFF | OFF |
| 13. P54CTB-150 MHz ✶✶ | ON | ON | OFF | ON |
| 14. P54CTB-166 MHz ✶✶ | ON | ON | OFF | OFF |
| 15. P54CTB-180 MHz ✶✶ | OFF | ON | OFF | ON |
| 16. P54CTB-200 MHz ✶✶ | OFF | ON | OFF | OFF |

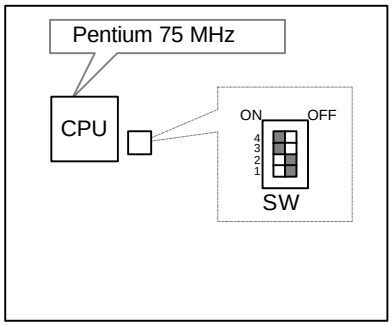
| AMD\Cyrix CPU | SW1 | SW2 | SW3 | SW4 |
|---|---|---|---|---|
| 17. AMDK5- 75 MHz-P75 | OFF | OFF | ON | ON |
| 18. AMDK5- 90 MHz-P90 | OFF | OFF | OFF | ON |
| 19. AMDK5-100 MHz-P100 | OFF | OFF | OFF | OFF |
| 20. AMDK5- 75 MHz-P100 | OFF | OFF | ON | ON |
| 21. AMDK5- 90 MHz-P120 | OFF | OFF | OFF | ON |
| 22. AMDK5-100 MHz-P133 | OFF | OFF | OFF | OFF |
| 23. AMDK5-120 MHz-P150 | ON | OFF | OFF | ON |
| 24. AMDK5-133 MHz-P166 | ON | OFF | OFF | OFF |
| 25. Cyrix 6x86-100 MHz-P120+ | ON | OFF | ON | ON |
| 26. Cyrix 6x86-110 MHz-P133+ | ON | OFF | ON | OFF |
| 27. Cyrix 6x86-120 MHz-P150+ | ON | OFF | OFF | ON |
| 28. Cyrix 6x86-133 MHz-P166+ | ON | OFF | OFF | OFF |

✶ Note : If Cyrix 6x86 is being used, please check the CPU Date Code after 605.

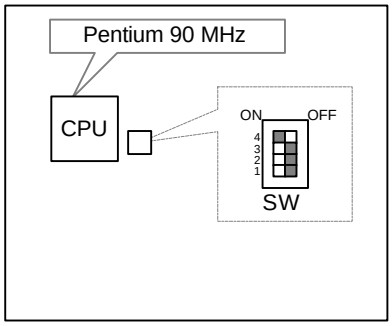
✶✶ Note : To support INTEL CPU P54CTB-150MHz/166MHz/180MHz/200MHz,

GA-586SVX is available from PCB Ver.1.51.

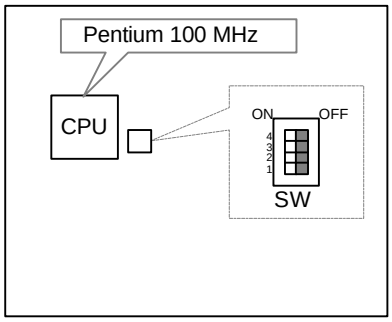
1. Pentium 75 MHz



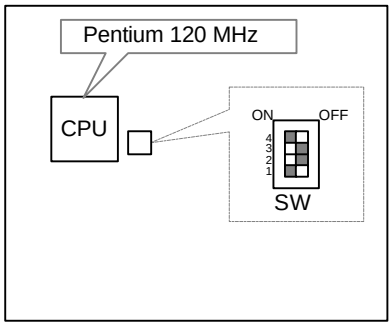

2. Pentium 90 MHz



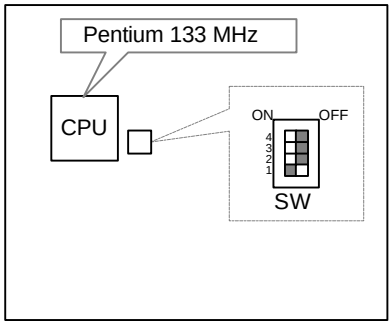

3. Pentium 100 MHz



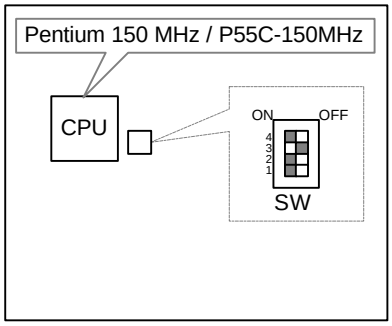

4. Pentium 120 MHz




5. Pentium 133 MHz

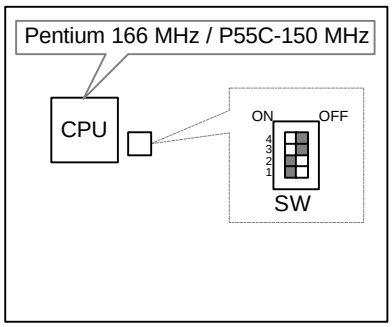



6. Pentium 150 MHz/P55C-150MHz

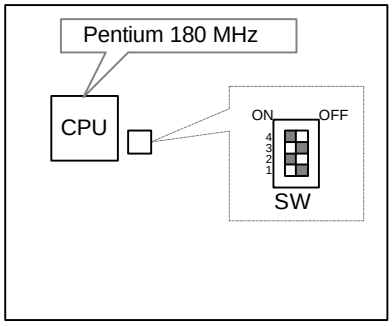



7. Pentium 166 MHz/P55C-

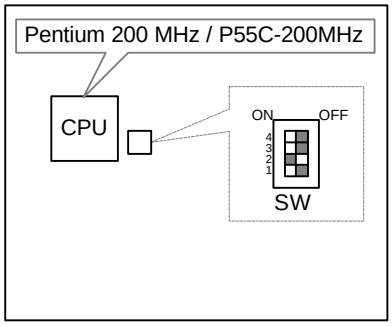
166MHz



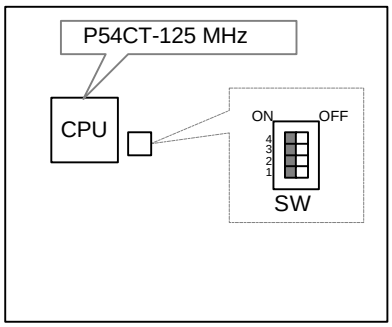

8. Pentium 180 MHz



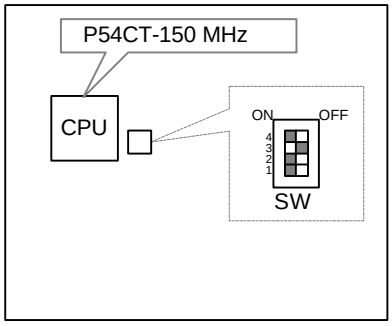

9. Pentium 200 MHz/P55C-200MHz



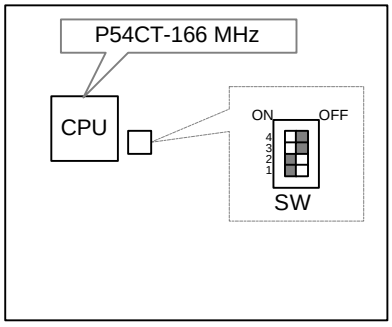
10. P54CT-125 MHz



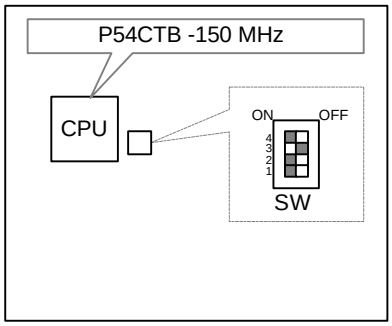

11. P54CT-150 MHz



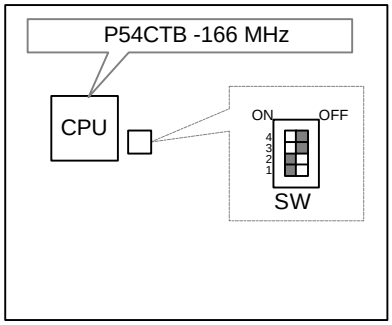

12. P54CT-166 MHz



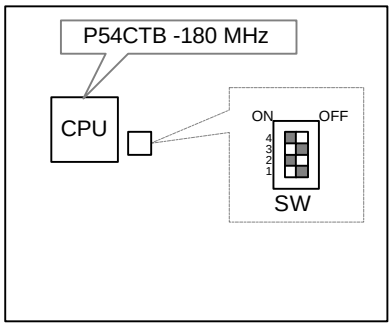

13. P54CTB-150 MHz



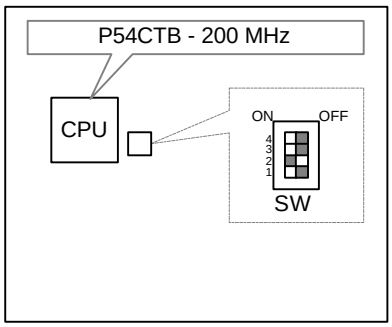

14. P54CTB-166 MHz



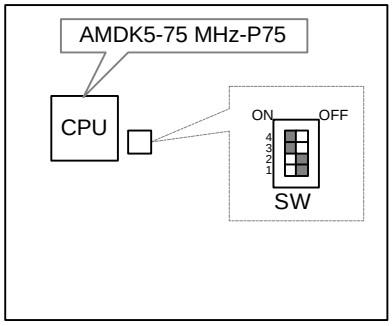

15. P54CTB - 180 MHz



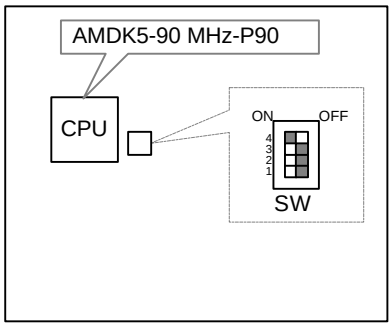
16. P54CTB - 200 MHz



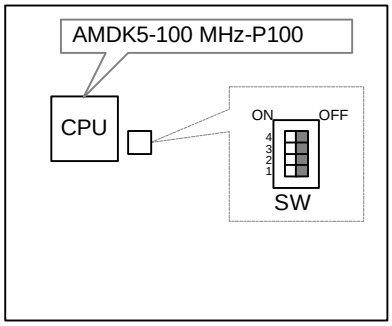

17. AMDK5- 75 MHz-P75



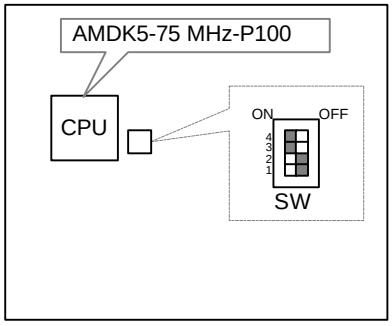

18. AMDK5- 90 MHz-P90



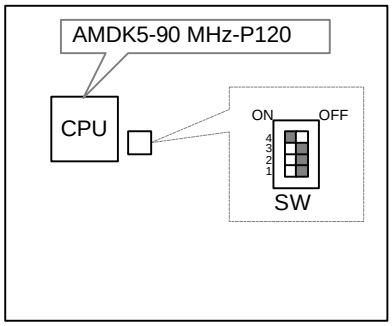
19. AMDK5-100 MHz-P100



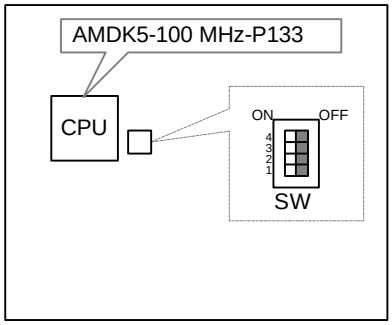

20. AMDK5- 75 MHz-P100



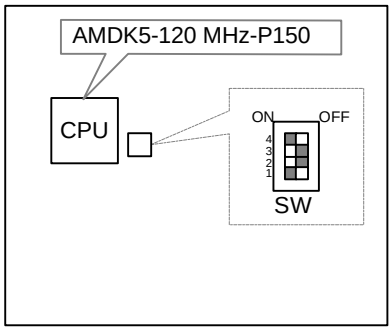

21. AMDK5- 90 MHz-P120



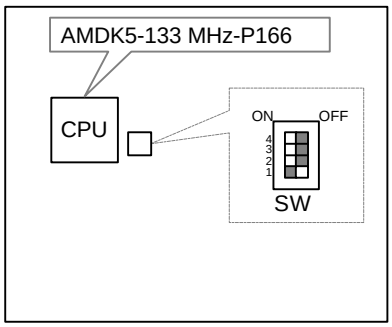

22. AMDK5-100 MHz-P133



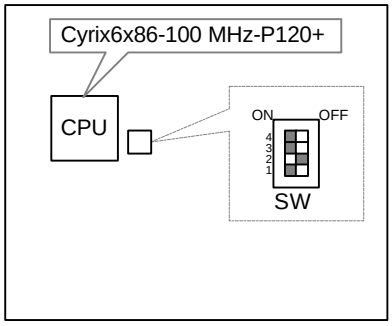

23. AMDK5-120 MHz-P150



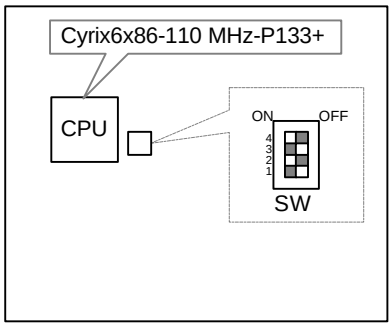
24. AMDK5-133 MHz-P166



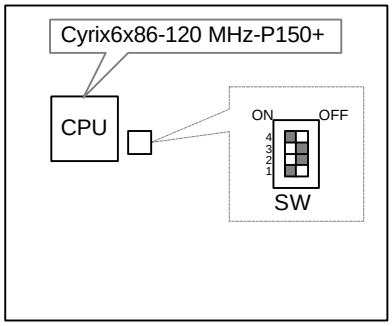

25. Cyrix 6x86-100 MHz-P120+



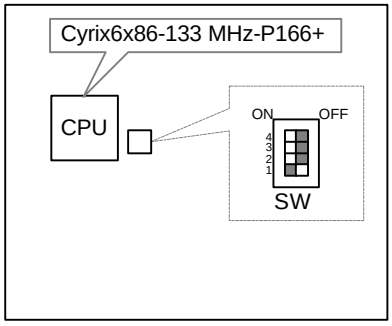

26. Cyrix 6x86-110 MHz-P133+



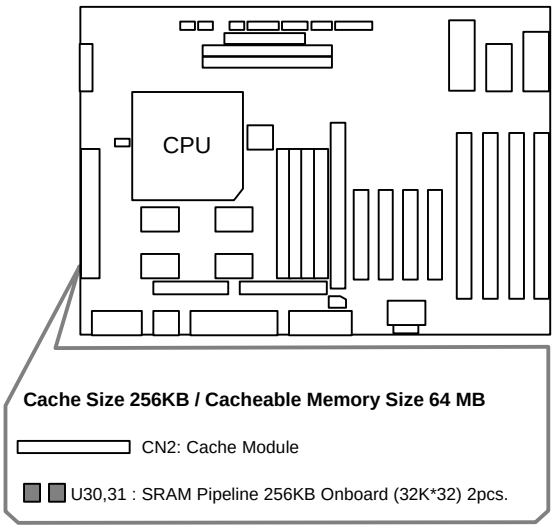
27. Cyrix 6x86-120 MHz-P150+

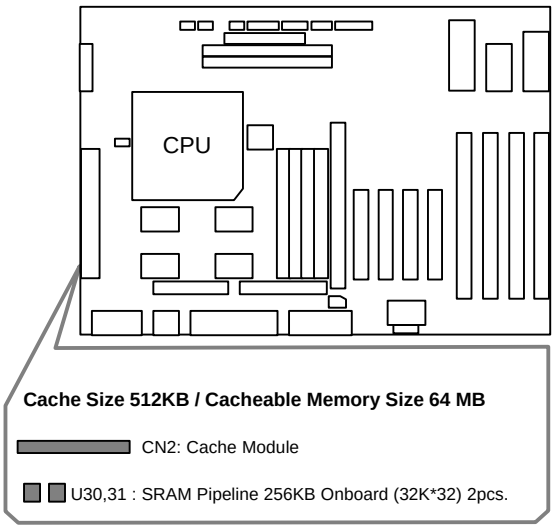



28. Cyrix 6x86-133 MHz-P166+



## III. SRAM Install



## IV. **Quick Installation Guide of Jumper setting:**

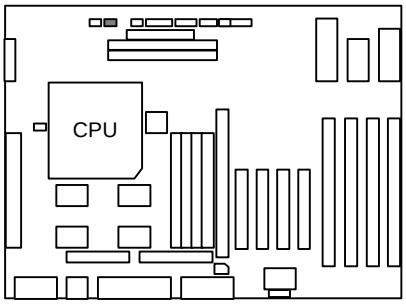
**GN: Green Function Switch**



Close: For system entering Green mode.

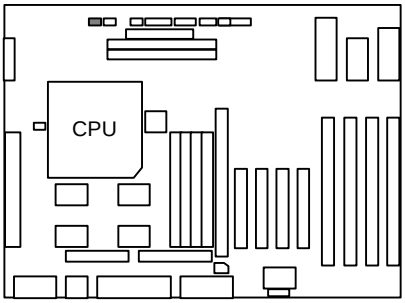


Open: Normal operation.




**GD: Green Function LED**


| Pin No. | Function |
|---|---|
| 1 | LED anode (+) |
| 2 | LED cathode (-) |



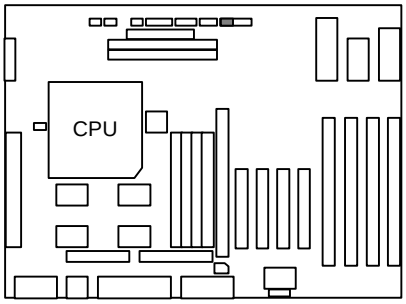

**RST: Reset Switch**



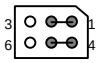
Close: For hardware reset system.



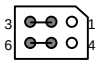
Open: Normal operation.



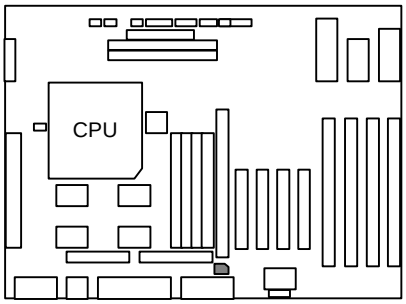
**SPK: Speaker Connector**




: LINE OUT

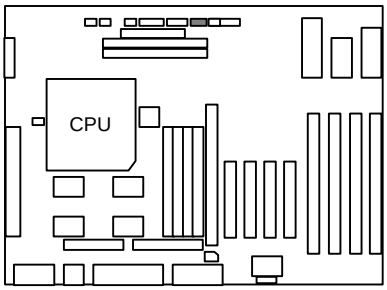



: SPK OUT

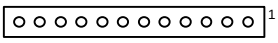



**PWR: Power LED and Key-Lock Connector**

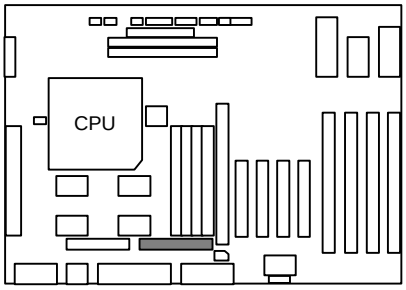

| Pin No. | Function |
|---|---|
| 1 | LED anode (+). |
| 2 | NC. |
| 3 | LED cathode (-). |




**POWER: Power Connector**

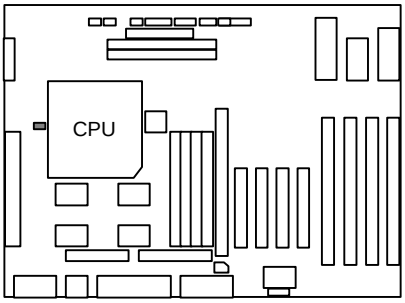



| Pin No. | Function |
|---|---|
| 1 | Power Good signal. |
| 2,10,11,12 | VCC (+5V) |
| 3 | +12V |
| 4 | -12V |
| 5,6,7,8 | GND |
| 9 | -5V |

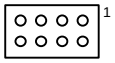


**JP8: CPU Cooling Fan Power Connector**

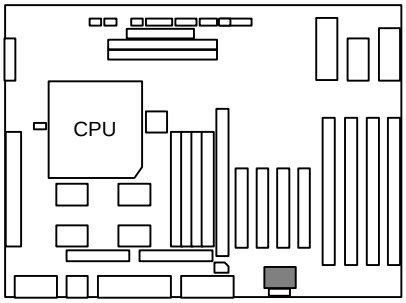

| Pin No. | Function |
|---|---|
| 1 | +12V |
| 2 | GND |




**J9: WAVE table Connector**

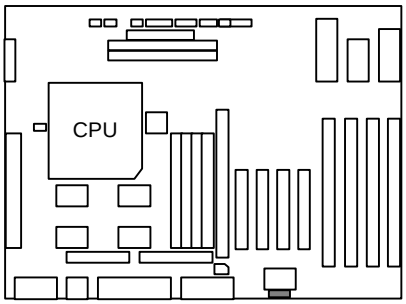



| Pin No. | Function |
|---|---|
| 1 | EMUR |
| 3 | EMUL |
| 2,4,6,7,8 | GND |
| 5 | NC |

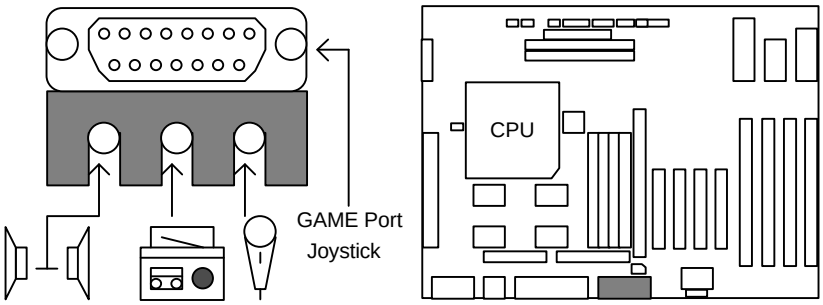


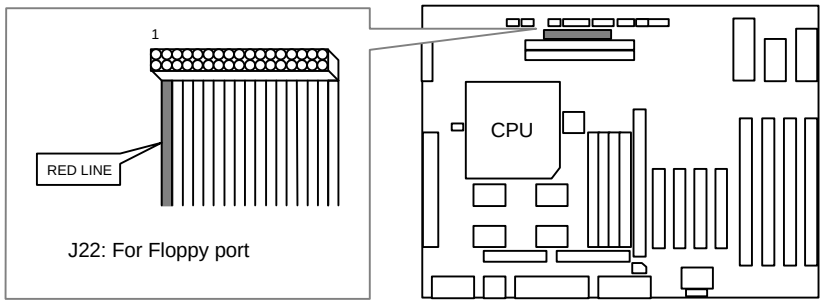

**J10: Audio Cable Connector**


| Pin No. | Function |
|---|---|
| 1,3 | GND |
| 2 | Left |
| 4 | Right |

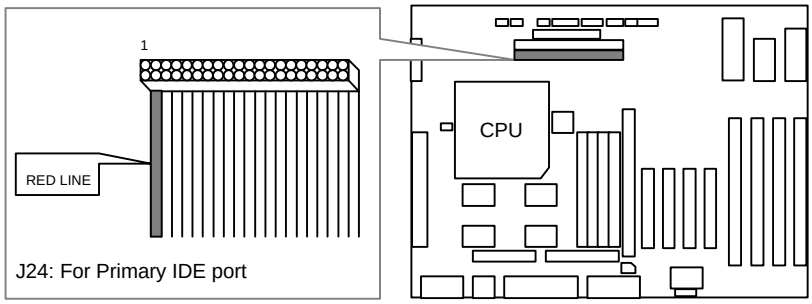


**J17,22,24,25,26,31,34: I/O Ports Connector**

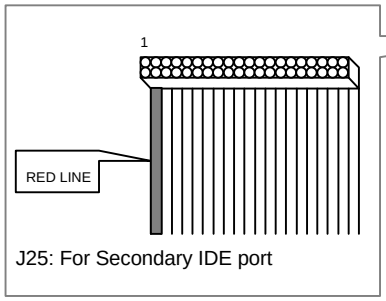


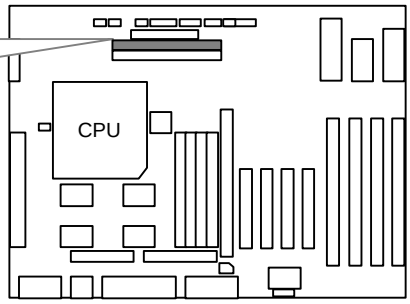

J22: For Floppy port



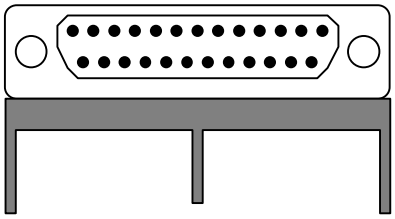

J24: For Primary IDE port

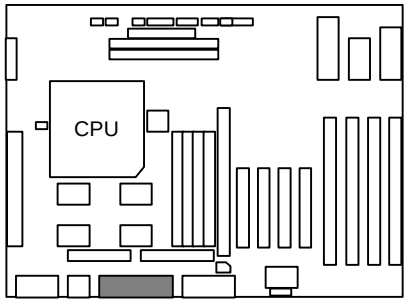



J25: For Secondary IDE port

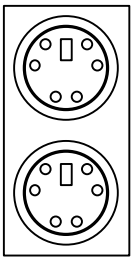



**J26: LPT Port**



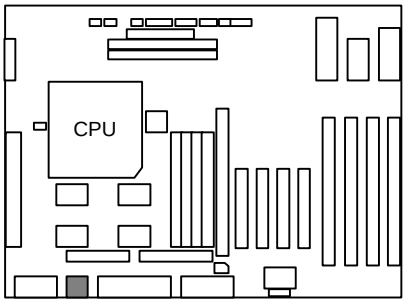



**J31: PS/2 Mouse / Keyboard Connector**



**PS/2 Mouse**

**PS/2 Keyboard**

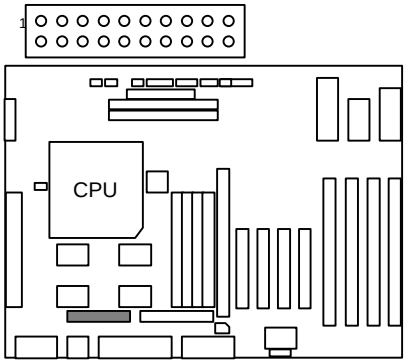



| PS/2 Mouse | |
|---|---|
| Pin No. | Function |
| 1 | Key Data |
| 2 | NC |
| 3 | GND |
| 4 | VCC (+5V) |
| 5 | Key Clock. |
| 6 | NC |

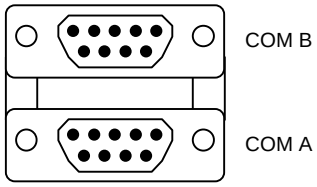
| PS/2 Keyboard | |
|---|---|
| Pin No. | Function |
| 1 | Key Data |
| 2 | NC |
| 3 | GND |
| 4 | VCC (+5V) |
| 5 | Key Clock. |
| 6 | NC |

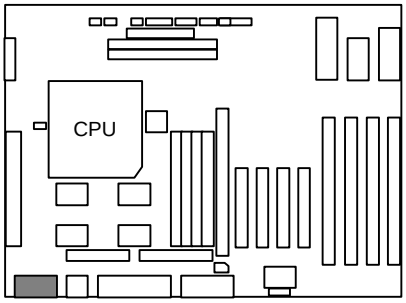
**J32: ATX Power Connector**

| Pin No. | Function |
|---|---|
| 1,2,11 | NC |
| 3,5,7,13,15,16,17 | GND |
| 4,6,19,20 | VCC |
| 8 | Power good |
| 9 | 5VSB |
| 10 | +12V |
| 12 | -12V |
| 14 | PSON |
| 18 | -5V |

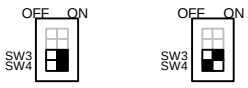



**J34:COMA Port / COMB Port**



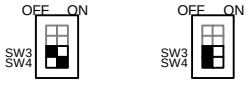

SW3, SW4: For System Speed




50 MHz



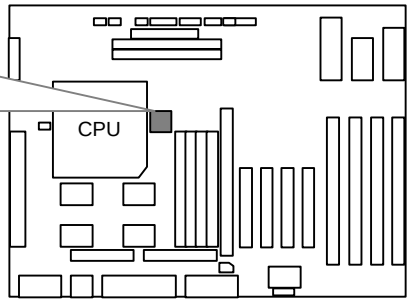

55 MHz




60 MHz




66 MHz



## V. Top Performance Test Setting:

Note:Users have to modify the value for each item in chipset features as follow:

Note:60ns EDO-60ns DRAM is necessary for top performance setting.

Chipset features setup

ROM PCI / ISA BIOS
CHIPSET FEATURES SETUP
AWARD SOFTWARE, INC.

| | | |
|---|---|---|
| Auto Configuration | **: Disabled** | |
| DRAM RAS# Precharge Time | **: 3** | |
| DRAM R/W Leadoff Timing | **: 6** | |
| Fast RAS To CAS Delay | **: 2** | |
| DRAM Read Burst (EDO/FPM) | **: x222/x333** | |
| DRAM Write Burst Timing | **: x222** | |
| Fast MA to RAS# Delay CLK | **: 1** | |
| Refresh RAS# Assertion | **: 4 CLKS** | |
| Turn-Around Insertion | **: Disabled** | |
| ISA Clock | : PCI CLK/4 | |
| Pipeline Cache Timing | **: Fastest** | |
| System BIOS Cacheable | : Enabled | ESC : Quit ↑ ↓ → ← : Select Item |
| Video BIOS Cacheable | : Enabled | F1 : Help PU/PD/+/- : Modify |
| 8 Bit I/O Recovery Time | : 1 | F5 : Old Values (Shift)F2 : Color |
| 16 Bit I/O Recovery Time | : 1 | F6 : Load BIOS Defaults |
| Memory Hole At 15M-16M | : Disabled | F7 : Load Setup Defaults |
| Peer Concurrency | : Enabled | |

The author assumes no responsibility for any errors or omissions which may appear in this document nor does it make a commitment to update the information contained herein.



OCTOBER 22, 1996 Taipei, Taiwan

## TABLE OF CONTENTS

# 1. INTRODUCTION

## 1.1. PREFACE

Welcome to use the **GA - 586SVX** motherboard. The motherboard is a Pipeline 256 KB / 512 KB CACHE PENTIUM™ Processor based PC / AT compatible system with ISA bus and PCI Local Bus, and has been designed to be the fastest PC / AT system. There are some new features allowing you to operate the system with just the performance you want.

This manual also explains how to install the motherboard for operation, and how to set up your CMOS CONFIGURATION with BIOS SETUP program.

## 1.2. KEY FEATURES

- Pentium® based PC / AT compatible mainboard with PCI - ISA Bus.
- 3 PCI Bus slots, 3 ISA Bus slots, 1 PCI / ISA slot.
- Supports Pentium processor running at 75-200 MHz, P54CT (125 / 150 / 166), P55C (150 / 166 / 200), P54CTB ( 150 / 166 / 180 / 200), AMDK5 (P-75 / P-90 / P-100), Cyrix 6x86-100 / 110 / 120 / 133 (P-120+ / P-133+ / P-150+ / P-166+).
- Supports true 64 bits CACHE and DRAM access mode.
- Supports 321 Pins (Socket 7) ZIF white socket on board.
- Supports 256 KB / 512 KB Pipeline Burst Sync. 2nd Cache.
- CPU L1 / L2 Write-Back cache operation.
- Supports 8 - 128 MB DRAM memory on board.
- Supports 1x168 pin 64/72 Bit DIMM module.
- Supports 2-channel Enhanced PCI IDE ports for 4 IDE Devices.
- Supports 2xCOM (16550), 1xLPT (EPP / ECP), 1x1.44MB Floppy port.
- Supports PS/2 Mouse port.
- Supports PS/2 Keyboard.
- Supports Green function, Plug & Play function.
- Licensed AWARD BIOS, FLASH EEPROM for BIOS update.
- BENCHMARQ3287 / DALLAS 12887 / ODIN 12C887 RTC on board.
- ATX Form-Factor Layout, 4 layers PCB.
- Supports USB port. (optional)
- Supports Creative Vibra 1bc on board.
- Supports IRDA TX/RX Header (optional).

## 1.3. PERFORMANCE LIST

The following performance data list is the testing results of some popular benchmark testing programs. These data are just referred by users, and there is no responsibility for different testing data values gotten by users. (The different Hardware & Software configuration will result in different benchmark testing results.)

- CPU Pentium™ processor 133 / 166 MHz
- DRAM EDO 8MB 2pcs. Total 16 MB (Panasonic EUXSR08XX00E)
- CACHE SIZE 256 KB Pipeline Burst SRAM (UMC UM61L3232AF-7)
- DISPLAY Matrox Millennium
- STORAGE Onboard IDE port + Quantum Fireball 1280AT
- O.S. MS DOS V6.22 / Windows for workgroup 3.11

≺DOS≻

| Program | Item | Unit | Pentium 133/66 | Pentium 166/66 |
|---|---|---|---|---|
| LandMark Speed | CPU | MHz | 771.42 | 964.28 |
| | FPU | MHz | 2589.62 | 3237.06 |
| V2.0 | VIDEO | chr/ms | 16384.00 | 16115 |
| | MIPS | Mips | 67.6 | 83.6 |
| Power Meter | Dhrystone | K-Dstone/s | 119.0 | 147.0 |
| | Whetstone | K-Wstone/s | 25623.4 | 32235.9 |
| V1.81 | Data Transfer Rate | KB/S | 14073.9 | 14275.0 |
| | Mean Seek | ms | 10.3 | 10.3 |
| | Track-Track Seek | ms | 2.6 | 2.6 |
| Norton System Info. | CPU | Index | 423.5 | 529.4 |
| V8.0 | Disk | Index | 22 | 21.9 |
| Core Test | DATA Transfer Rate | KB/S | 12416 | 12448 |
| | Sequential Read | ms | 6304 | 6288 |
| V.3.02 | Random Read | ms | 2384 | 2400 |
| | Performance Index | Index | 79.23 | 79.38 |
| PC BenchMark | DOS Mark | Index | 1121.33 | 1220.69 |
| | CPU Mark16 | Index | 287.34 | 342.76 |
| V9.0 | Video Score | Index | 6277.55 | 6266.21 |
| | Disk Score | Index | 607.13 | 639.53 |

≺ WINDOWS≻– with Display Driver MGA Millennium power desktop1024 x 768 x 256 colors x 72Hz

– with Triones IDE Bus Master Driver Ver.3.20.

| Program | Item | Unit | Pentium 133/66 | Pentium 166/66 |
|---|---|---|---|---|
| Winbench 95 | Disk Winmark95 | KB/s | 1090 | 1100 |
| | Graphics Winmark95 | Mpixels/S | 22.7 | 26 |
| Winstone 95 | Winstone95 | Index | 207.4 | 223.3 |
| Winbench 96 | CPU mark16 | | 281 | 319 |
| | CPU mark32 | | 293 | 331 |
| | Winbench 96 | | 16.7 | 18.8 |
| Winstone 96 | Winstone 96 | | 84.5 | 91.7 |

- CPU Pentium™ processor 133/166 MHz
- DRAM EDO 8MB 2pcs. Total 16 MB (Panasonic EUXSR08XX00E)
- CACHE SIZE 512 KB Pipeline Burst SRAM (UMC UM61L3232AF-7)
- DISPLAY Matrox Millennium
- STORAGE Onboard IDE port + Quantum Fireball 1280AT
- O.S. MS DOS V6.22 / Windows for workgroup 3.11

≺DOS≻

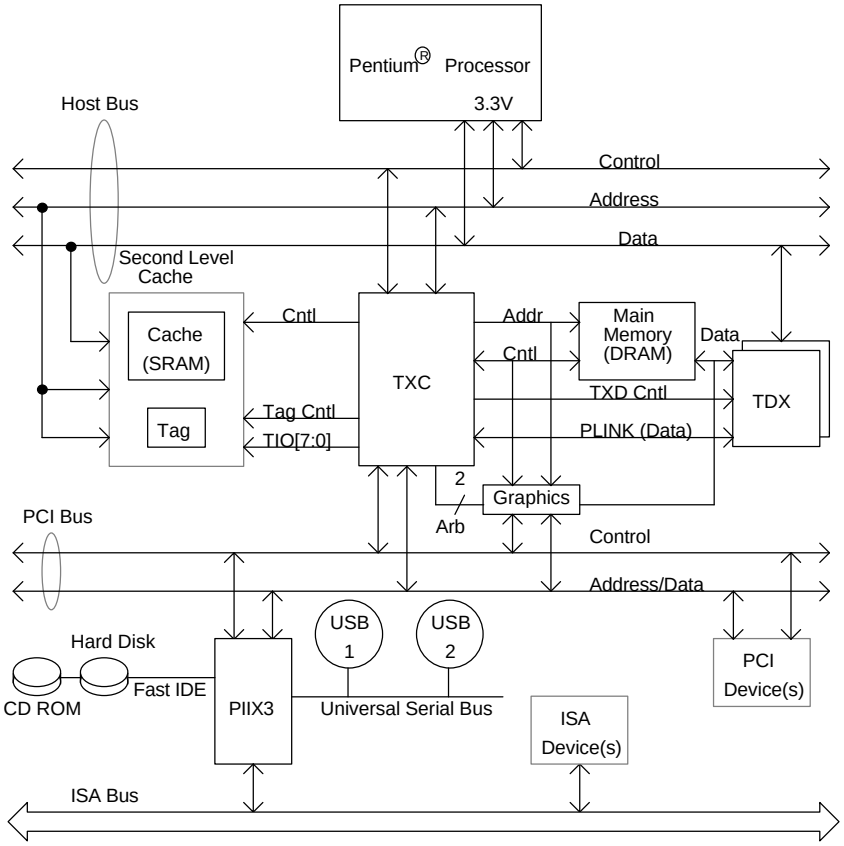
| Program | Item | Unit | Pentium 133/66 | Pentium 166/66 |
|---|---|---|---|---|
| LandMark Speed | CPU | MHz | 771.42 | 964.28 |
| | FPU | MHz | 2589.65 | 3237.09 |
| V2.0 | VIDEO | chr/ms | 16384.00 | 16115 |
| | MIPS | Mips | 67.7 | 83.6 |
| Power Meter | Dhrystone | K-Dstone/s | 119.0 | 147.0 |
| | Whetstone | K-Wstone/s | 25623.4 | 32235.9 |
| V1.81 | Data Transfer Rate | KB/S | 14073.9 | 14275.0 |
| | Mean Seek | ms | 10.2 | 10.3 |
| | Track-Track Seek | ms | 2.6 | 2.6 |
| Norton System Info. | CPU | Index | 423.5 | 529.4 |
| V8.0 | Disk | Index | 22.0 | 22 |
| Core Test | DATA Transfer Rate | KB/S | 12448 | 12448 |
| | Sequential Read | ms | 6304 | 6304 |
| V.3.02 | Random Read | ms | 2384 | 2384 |
| | Performance Index | Index | 79.43 | 79.43 |
| PC BenchMark | DOS Mark | Index | 1123.68 | 1226.45 |
| | CPU Mark16 | Index | 289.47 | 347.66 |
| V9.0 | Video Score | Index | 6261.62 | 6266.78 |
| | Disk Score | Index | 607 | 641.06 |

≺ WINDOWS≻– with Display Driver MGA Millennium power desktop1024 x 768 x 256 colors x 72Hz

– with Triones IDE Bus Master Driver Ver.3.20.

| Program | Item | Unit | Pentium 133/66 | Pentium 166/66 |
|---|---|---|---|---|
| Winbench 95 | Disk Winmark95 | KB/s | 1150 | 1120 |
| | Graphics Winmark95 | Mpixels/S | 23.3 | 26.8 |
| Winstone 95 | Winstone95 | Index | 210.2 | 225.9 |
| Winbench 96 | CPU mark16 | | 292 | 337 |
| | CPU mark32 | | 311 | 351 |
| | Winbench 96 | | 16.9 | 18.7 |
| Winstone 96 | Winstone 96 | | 85.1 | 93 |

## 1.4. BLOCK DIAGRAM



## 1.5. INTRODUCE THE PCI - BUS

Connecting devices to a CPU local bus can dramatically increase the speed of I/O-bound peripherals with only a slight increase in cost over traditional systems. This price / performance point has created a vast market potential for local bus products. The main barrier to this market has been the lack of an accepted standard for local bus peripherals. Many mainboard and chipset manufactures developed their own local bus implementations, but they are incompatible with each other. The VL (Video Electronics Standards Association) local bus and PCI (Peripheral Component Interconnect) bus specification was created to end this confusion.

The PCI - bus standard, under development since Jun. 1992, which is designed to bring workstation-level performance to standard PC platform. The PCI - bus removes many of the bottlenecks that have hampered PC for several years. On the PCI - bus, peripherals operate at the native speed of the computer system, thus enabling data transfer between peripherals and the system at maximum speed. This performance is critical for bandwidth-constrained devices such as video, multimedia, mass storage, and networking adapters.

PCI - bus standard provides end-users with a low-cost, extendible and portable local bus design, which will allow system and peripherals from different manufactures to work together.

## 1.6. FEATURES

- 32 bits bus transfer mode.
- Bus Master or Slave access.
- Memory burst transfer to 132 MB/sec.
- 33 MHz operation speed.
- 10 device loading ability.
- CPU independent.

# 2. SPECIFICATION

## 2.1. HARDWARE

- CPU
  - Pentium™ processor 75 - 200 MHz, P55C, P54CT, P54CTB, AMDK5(P-75 / P-90 / P-100), Cyrix6X86(P-120+ / P-133+/ P-150+ / P-166+).
  - 321 pins (socket 7) ZIF white socket on board.
  - 3.52V / 2.8V Dual Power Ready.
- COPROCESSOR
  - Included in Pentium.
- SPEED
  - 50 / 60 / 66 MHz system and 25 / 30 / 33 PCI-Bus speed.
  - 7.5 / 8 MHz AT bus speed.
  - Hardware and Software speed switchable function.
- DRAM MEMORY
  - 2 banks 72 pins SIMM module socket on board.
  - 1 banks 168 pins DIMM module socket on board
  - Use 4 / 8 / 16 / 32 MB 60~70 ns SIMM module DRAM.
  - 8 ~ 128 MB DRAM size.
  - Supports Fast Page / EDO DRAM access mode.
  - Supports 1x168 pin 64 / 72 bit DIMM module.
  - Supports PS/2 Keyboard.
  - IRDA TX/RX Header optional.
- CACHE MEMORY
  - 16 KB cache memory included in Pentium.
  - Pipeline Burst Sync. 2nd cache.
  - Supports Write Back cache function for both CPU & on board cache.
- SHADOW RAM
  - Shadow RAM cacheable function.
- SOUND
  - Supports creative VIBRA 16C.
- I/O BUS SLOTS
  - 4 Master / Slave PCI BUS.
  - 4 16-bit ISA BUS.
- IDE PORTS
  - 2-channel Enhanced IDE on board. (Using IRQ14, 15)
  - Supports Mode 3,4 IDE & ATAPI CD - ROM.
- I/O PORTS
  - Supports 2 16550 COM ports. (Using IRQ4, 3)
  - Supports 1 EPP/ECP LPT port. (Using IRQ7 or 5 and DMA3 or 1)
  - Supports 1 1.44MB Floppy port. (Using DMA2 & IRQ6)

| | |
|---|---|
| | – Supports PS/2 Mouse. (Using IRQ12 ) |
| • GREEN FUNCTION | – Supports Standby & Suspend mode. |
| | – Supports Green switch & LED. |
| | – Supports IDE & Display power down. |
| | – Monitors all IRQ / DMA / Display / I/O events. |
| • BIOS | – 128KB FLASH EEPROM. |
| | – Supports Plug & Play Function. |
| • DIMENSION | – ATX from-factor Layout 4 layers. |

## 2.2. SOFTWARE

| | |
|---|---|
| • BIOS | – Licensed AWARD BIOS. |
| | – AT CMOS Setup, BIOS / Chipset Setup, Green Setup, Hard Disk Utility included. |
| • O.S. | – Operation with MS-DOS V6.22, Windows for workgroup 3.11, Windows 95, WINDOWS NT 3.51, OS/2 Warp 3.0, NOVELL 3.12 / 4.01 / 4.1 and SCO UNIX 3.2.4. |

## 2.3. ENVIRONMENT

| | |
|---|---|
| • Ambient Temp. | – 0°C to +50°C (Operating). |
| • Relative Hum. | – 0 to +85% (Operating). |
| • Altitude | – 0 to 10,000 feet (Operating). |
| • Vibration | – 0 to 1,000 Hz. |
| • Electricity | – 4.9 V to 5.2 V. |

# 3. HARDWARE INSTALLATION

## 3.1. UNPACKING

The mainboard package should contain the following:

- The **GA - 586SVX** mainboard.
- USER'S MANUAL.
- Cable set for I/O Device.
- Diskette for BUS Master IDE Driver & Audio Driver.

The mainboard contains sensitive electric components which can be easily damaged by static electricity, so the mainboard should be left in its original packing until it is installed.

Unpacking and installation should be done on a grounded anti-static mat. The operator should be wearing an anti static wristband, grounded at the same point as the anti-static mat.

Inspect the mainboard carton for obvious damage. Shipping and handling may cause damage to your board. Be sure there are no shipping and handling damages on the board before proceeding.

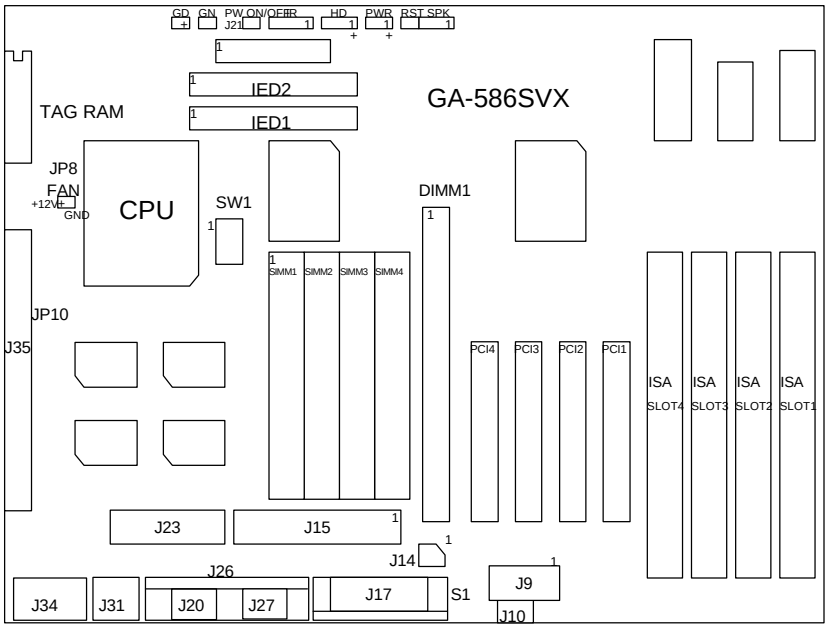
After opening the mainboard carton, extract the system board and place it only on a grounded anti-static surface component side up. Again inspect the board for damage. Press down on all of the socket IC's to make sure that they are properly seated. Do this only on with the board placed on a firm flat surface.

**DO NOT APPLY POWER TO THE BOARD IF IT HAS BEEN DAMAGED.**

You are now ready to install your mainboard. The mounting hole pattern on the mainboard matches the IBM-AT system board. It is assumed that the chassis is designed for a standard IBM XT/AT mainboard mounting.

Place the chassis on the anti-static mat and remove the cover. Take the plastic clips, Nylon stand-off and screws for mounting the system board. Keep them separate.

## 3.2. MAINBOARD LAYOUT




≺Figure 3.1≻

## 3.3. QUICK REFERENCE FOR JUMPERS & CONNECTORS

| ♦ J18: IDE Hard Disk Active LED | |
|---|---|
| Pin No. | Function |
| 1 | LED anode (+). |
| 2 | LED cathode (-). |
| 3 | LED cathode (-). |
| 4 | LED anode (+). |

| ♦ J22: Green Function Switch | |
|---|---|
| Pin No. | Function |
| Close | For system entering Green mode ( Suspend mode). |
| Open | Normal operation. |

| ♦ GD: Green Function LED | |
|---|---|
| Pin No. | Function |
| 1 | LED anode (+). |
| 2 | LED cathode (-). |

♦ RST: Reset Switch

| | |
|---|---|
| Open | For normal operation. |
| Close | For hardware reset system. |

♦ SPK: Speaker Connector

| Pin No. | Function |
|---|---|
| 1 | VCC. |
| 2 | NC. |
| 3 | NC. |
| 4 | Data. |

♦ PWR: Power LED Connector

| Pin No. | Function |
|---|---|
| 1 | LED anode (+). |
| 2 | NC. |
| 3 | LED cathode (-). |

♦ J15: Power Connector

| Pin No. | Function |
|---|---|
| 1 | Power Good signal |
| 2,10,11,12 | VCC (+5V) |
| 3 | +12V |
| 4 | -12V |
| 5,6,7,8 | GND |
| 9 | -5V |

♦ J32: ATX Power Connector

| Pin No. | Function |
|---|---|
| 12 | -12V |
| 10 | +12V |
| 9 | 5VSB |
| 18 | -5V |
| 4,6,19,20 | 5V (VCC) |
| 3,5,7,13.15.16.17 | GND. |
| 14 | PS-ON |
| 8 | PW-OK |

♦ JP18: CPU Cooling Fan Power Connector

| Pin No. | Function |
|---|---|
| 1 | +12V |
| 2 | GND |

♦ SW: CPU INT./EXT. FREQ. RATIO

| SW1 | SW2 | | SW3 | SW4 | MHz |
|---|---|---|---|---|---|
| OFF | OFF | X 1.5 | ON | ON | 50 |
| ON | OFF | X 2 | ON | OFF | 55 |
| ON | ON | X 2.5 | OFF | ON | 60 |
| OFF | ON | X 3 | OFF | OFF | 66 |

♦ J2,3,4,22,24,25,26 I/O Ports Connector

| | |
|---|---|
| J22 | For Floppy port |
| J24 | For Primary IDE port |
| J25 | For Secondary IDE port |
| J26 | For LPT port |
| J31 | For PS/2 Mouse port & PS/2 Keyboard Port. |
| J34 | For COM A (Serial port1) & COM B (Serial port2) |

## 3.4. DRAM INSTALLATION ( EDO & F.P. )

The mainboard can be installed with 4 / 8 / 16 / 32 MB 72 pins SIMM module DRAM, and the DRAM speed must be 60 or 70 ns. The DRAM memory system on mainboard consists of bank 0, & bank 1. Each bank consists of 2 sockets for 72 pins SIMM module DRAM. Because the 72 pins SIMM module is 32 bits width, using 2 PCs which can match a 64 bits system. The total memory size is 8 - 128 MB.

For the DRAM installation position, please refer to Figure 3.1. Note that the Pin 1 of SIMM module must match with the Pin 1 of SIMM socket when the DRAM SIMM module is installed.

Insert the DRAM SIMM module into the SIMM socket at 45 degree angle. If there is a wrong direction of Pin 1, the DRAM SIMM module couldn't be inserted into socket completely. After completely insert SIMM module into socket, then press the SIMM module in vertical direction until the left and right metal holders can keep the SIMM module standing up firmly.

***DRAM Installation (SYNC. DRAM)***

The mainboard can be installed with 8 / 16 / 32 / 64 MB Sync. DRAM. The Sync. DRAM memory system on mainboard consists of DIMM1 only.

For the Sync. DRAM installation position, please refers to Figure 3.1. Note that the Pin 1 of DIMM module must match with the Pin 1 of DIMM socket when the Sync. DRAM DIMM module is installed.

DRAM configuration table:

| BANK0 (SIMM 1 & 2) | BANK1 (SIMM 3 & 4) | TOTAL SIZE |
|---|---|---|
| 4MB * 2pcs. | | 8 MB |
| 4MB * 2pcs. | 4MB * 2pcs. | 16MB |
| 8MB * 2pcs. | | 16MB |
| 8MB * 2pcs. | 4MB * 2pcs. | 24MB |
| 8MB * 2pcs. | 8MB * 2pcs. | 32MB |
| 16MB * 2pcs. | | 32MB |
| 16MB * 2pcs. | 4MB * 2pcs. | 40MB |
| 16MB * 2pcs. | 8MB * 2pcs. | 48MB |
| 16MB * 2pcs. | 16MB * 2pcs. | 64MB |
| 32MB * 2pcs. | | 64MB |
| 32MB * 2pcs. | 4MB * 2pcs. | 72MB |
| 32MB * 2pcs. | 8MB * 2pcs. | 80MB |
| 32MB * 2pcs. | 16MB * 2pcs. | 96MB |
| 32MB * 2pcs. | 32MB * 2pcs. | 128MB |

| DIMM 1 | TOTAL SIZE |
|---|---|
| 8MB | 8MB |
| 16MB | 16MB |
| 32MB | 32MB |
| 64MB | 64MB |

## 3.5. SRAM INSTALLATION

***Sync. SRAM (PipeLine Burst SRAM)***

If Sync SRAM Module is installed, it consists of Pipeline Burst 2 PCs 32 K x 32 from 256K upgradable to 512K.

**There is no jumper for cache size setting.**

## 3.6. CPU INSTALLATION AND JUMPERS SETUP

The system speed depends on the frequency of CLOCK GENERATOR. The user can change SW1 selection to set up the system speed to 50 MHz, 60 MHz or 66 MHz for 3.3V/2.5V Pentium Processor (75-200 MHz) / AMDK5(P-75 / P-90) / Cyrix 6x86 (P-120+ / P-150+ / P-166+).

The mainboard can use PENTIUM processor, P54CT, P55C or P54CTB, AMDK5, Cyrix6x86 CPU, and the CPU speed must match with the frequency of CLOCK GEN. It will cause system hanging up if the CLOCK GEN.'S

frequency is faster than CPU's.

- **The CPU is a sensitive electric component and it can be easily damaged by static electricity, so users must keep it away from metal surface when the CPU is installed onto mainboard.**
- **When the user installs the CPU on socket, please notice that the PIN 1 of CPU is in the same corner as the PIN 1 of socket!**
- **Before the CPU is installed, the mainboard must be placed on a flat plane in order to avoid being broken by the pressure of CPU installation.**

### 3.7. CMOS RTC & ISA CFG CMOS SRAM

There're RTC & CMOS SRAM on board, they have a power supply from internal battery to keep the DATA inviolate & effective. The RTC is a REAL-TIME CLOCK device which provides the DATE & TIME to the system. The CMOS SRAM is used for keeping the information of ISA device system configuration, so the system can automatically boot OS every time.

Due to the fact that the life-time of RTC internal battery is 5 years, the user can change a new RTC to replace old one after it does not work. The new one's brand and type must be same with the old one.

### 3.8. SPEAKER CONNECTOR INSTALLATION

There is always a speaker in AT system for sound purpose. The 4 - Pins connector **SPK** is used to connect speaker. The speaker can work well in both direction of connector when it is installed to the connector **SPK** on mainboard.

### 3.9. POWER LED CONNECTOR INSTALLATION

There is a system power LED light on the panel of case. The power LED will light on when system is powered-on. The connector should be installed to **PWR** of mainboard in correct direction.

### 3.10. TURBO SWITCH CONNECTOR INSTALLATION

The TURBO switch on the panel is used for controlling the system speed. Some program developed on XT should be executed with a low speed system, so a high speed system needs the speed switching function to change its running speed.

The mainboard uses 50 MHz speed method to implement TURBO switching function. The **TB** on mainboard should be connected to the TURBO switch on panel, and user can push in or pop out the TURBO switch to enable or

disable the turbo function of system.

**Please don't use switch ON/OFF when power is ON.**

### 3.11. TURBO LED CONNECTOR INSTALLATION

The TURBO LED on panel can indicate the current speed status of system. The TURBO LED connector should be installed to **TD** in correct direction.

### 3.12. HARDWARE RESET SWITCH CONNECTOR INSTALLATION

The RESET switch on panel provides users with HARDWARE RESET function which is almost the same as power-on/off. The system will do a cold start after the RESET switch is pushed and released by user. The RESET switch is a 2 PIN connector and should be installed to **RST** on mainboard.

### 3.13. GREEN FUNCTION INSTALLATION

For the purpose of power saving, there are two jumpers, **GN** and **GD**, to make sure that the power saving function is working. The **GD** is an indicator (green LED) for green function. If the green LED is ON, the system is operating in green mode. The **GN** is a switch to force the system to get into green mode immediately.

### 3.14. PERIPHERAL DEVICE INSTALLATION

After installation of the device and setup of the jumpers, the mainboard can be mounted into the case and fixed by screw. To complete the mainboard installation, the peripheral devices could be installed now. The basic system needs a display interface card and a storage device.

If a PCI - Bus device is to be installed in the system, any one of four PCI - Bus slots can be used for Slave or Master PCI - Bus device.

After installing the peripheral device, the user should check everything again and prepare to power-on the system.

### 3.15. KEYBOARD SETTING FUNCTION

After booting the O.S., there are some special functions used by keyboard as follows:

| | |
|---|---|
| "CTRL_ALT_DEL" | – Pressing these keys simultaneously will cause system to Warm Start (Software Reset). |

# 4. BIOS CONFIGURATION

Award's BIOS ROM has a built-in Setup program that allows users to modify the basic system configuration. This type of information is stored in battery-backed CMOS SRAM so that it retains the Setup information when the power is turned off.

## 4.1. ENTERING SETUP

To Power ON the computer and press <Del> immediately will allow you to enter Setup. The other way to enter Setup is to power on the computer. When the below message appears briefly at the bottom of the screen during the POST (Power On Self Test), press <Del> key or simultaneously press <Ctrl>, <Alt>, and <Esc> keys.

- **TO ENTER SETUP BEFORE BOOT PRESS CTRL-ALT-ESC OR DEL KEY**

If the message disappears before you respond and you still wish to enter Setup, restart the system to try again by turning it OFF then ON or pressing the "RESET" bottom on the system case. You may also restart by simultaneously pressing <Ctrl>,<Alt>, and <Del> keys. If you do not press the keys at the correct time and the system does not boot, an error message will be displayed and you will again be asked to,

- **PRESS F1 TO CONTINUE, CTRL-ALT-ESC OR DEL TO ENTER SETUP**

## 4.2. CONTROL KEYS

| | |
|---|---|
| Up arrow | Move to previous item |
| Down arrow | Move to next item |
| Left arrow | Move to the item in the left hand |
| Right arrow | Move to the item in the right hand |
| Esc key | Main Menu - Quit and not save changes into CMOS<br>Status Page Setup Menu and Option Page Setup Menu - Exit current page and return to Main Menu |
| PgUp key | Increase the numeric value or make changes |
| PgDn key | Decrease the numeric value or make changes |
| F1 key | General help, only for Status Page Setup Menu and Option Page Setup Menu |
| F2 key | Change color from total 16 colors |
| F3 key | Calendar, only for Status Page Setup Menu |
| F4 key | Reserved |
| F5 key | Restore the previous CMOS value from CMOS, only for Option Page Setup Menu |
| F6 key | Load the default CMOS value from BIOS default table, only for Option Page Setup Menu |
| F7 key | Load the default |
| F8 key | Reserved |
| F9 key | Reserved |
| F10 key | Save all the CMOS changes, only for Main Menu |

## 4.3. GETTING HELP

### *4.3.1. Main Menu*

The on-line description of the highlighted setup function is displayed at the bottom of the screen.

### *4.3.2. Status Page Setup Menu / Option Page Setup Menu*

Press F1 to pop up a small help window that describes the appropriate keys to use and the possible selections for the highlighted item. To exit the Help Window press <Esc>.

## 4.4. THE MAIN MENU

Once you enter Award BIOS CMOS Setup Utility, the Main Menu (Figure 4.1) will appear on the screen. The Main Menu allows you to select from twelve setup functions and two exit choices. Use arrow keys to select among the items and press <Enter> to accept or enter the sub-menu.

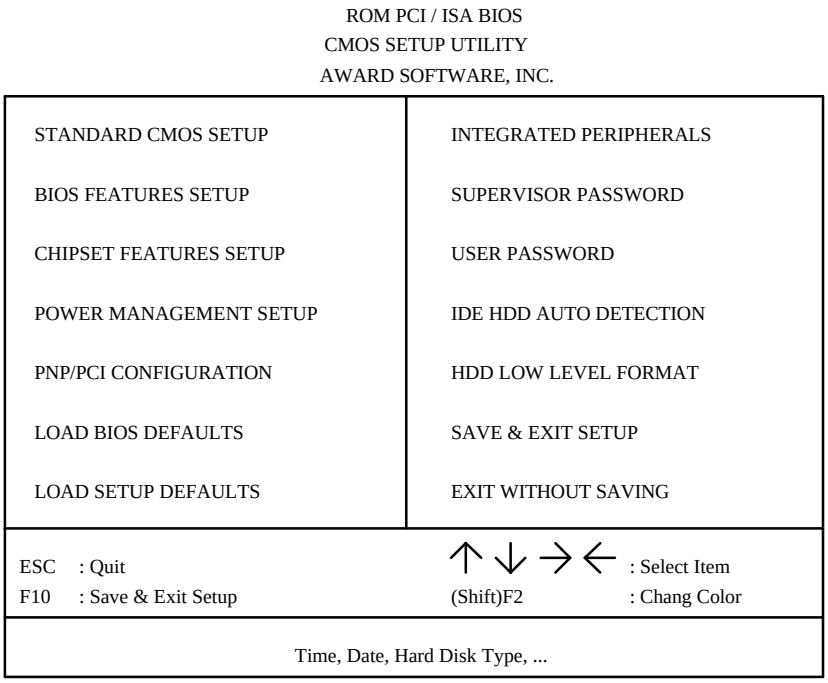



Figure 4.1: Main Menu

- Standard CMOS setup

  This setup page includes all the items in a standard compatible BIOS.
- BIOS features setup

  This setup page includes all the items of Award special enhanced features.
- Chipset features setup

  This setup page includes all the items of chipset special features.
- Power management setup

  This setup page includes all the items of Green function features.
- PNP/PCI configuration

  This setup page includes all the items of PNP/PCI configuration features.
- Load BIOS defaults

  BIOS defaults indicates the most appropriate value of the system parameter which the system would be in safe configuration.
- Load setup defaults

  BIOS defaults indicates the most appropriate value of the system parameter which the system would be in safe configuration.
- Integrated Peripherals

  This setup page includes all the items of peripherals features.
- Supervisor Password

  Chang, set, or disable password. It allows you to limit access to the system and Setup, or just to Setup.
- User Password

  Chang, set, or disable password. It allows you to limit access to the system.
- IDE HDD auto detection

  Automatically configure hard disk parameter.
- HDD low level format

  Low level format IDE Hard Disk.
- Save & exit setup

  Save CMOS value changes to CMOS and exit setup.
- Exit without save

  Abandon all CMOS value changes and exit setup.

## 4.5. STANDARD CMOS SETUP MENU

The items in Standard CMOS Setup Menu (Figure 4.2) are divided into 8 categories. Each category includes no, one or more than one setup items. Use the arrows to highlight the item and then use the <PgUp> or <PgDn> keys to select the value you want in each item.

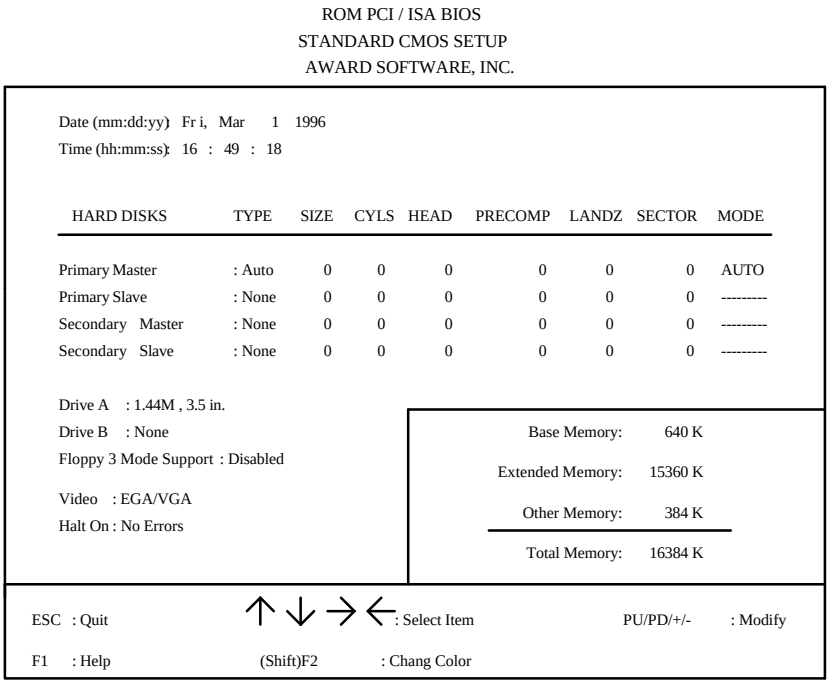



Figure 4.2: Standard CMOS Setup Menu

- Date

  The date format is <day>, <date> <month> <year>. Press <F3> to show the calendar.

| | |
|---|---|
| day | The day, from Sun to Sat, determined by the BIOS and is display-only |
| date | The date, from 1 to 31 (or the maximum allowed in the month) |
| month | The month, Jan. through Dec. |
| year | The year, from 1900 through 2099 |

- Time

  The time format in <hour> <minute> <second>. The time is calculated base on the 24-hour military-time clock. For example, 1 p.m. is 13:00:00.

- Primary HDDs / Secondary HDDs

  The category identify the types of hard disk drive that has been installed in the computer. There are 45 pre-defined types and a user definable type. Type 1 to Type 45 are pre-defined. Type User is user-definable and type Auto will automatically detect HDD's type..

  Press PgUp or PgDn to select a numbered hard disk type or type the number and press <Enter>. Note that the specifications of your drive must match with the drive table. The hard disk will not work properly if you enter improper information for this category. If your hard disk drive type is not matched or listed, you can use Type User to define your own drive type manually.

  If you select Type User, related information is asked to be entered to the following items. Enter the information directly from the keyboard and press <Enter>. Those information should be provided in the documentation form of your hard disk vendor or the system manufacturer.

| | |
|---|---|
| CYLS. | number of cylinders |
| HEADS | number of heads |
| PRECOMP | write precomp |
| LANDZONE | landing zone |
| SECTORS | number of sectors |

  If a hard disk has not been installed select NONE and press <Enter>.

- Drive A type / Drive B type

  The category identify the types of floppy disk drive A or drive B that has been installed in the computer.

| | |
|---|---|
| None | No floppy drive installed |
| 360K, 5.25 in. | 5-1/4 inch PC-type standard drive; 360 kilobyte capacity. |
| 1.2M, 5.25 in. | 5-1/4 inch AT-type high-density drive; 1.2 megabyte capacity (3-1/2 inch when 3 Mode is Enabled). |
| 720K, 3.5 in. | 3-1/2 inch double-sided drive; 720 kilobyte capacity |
| 1.44M, 3.5 in. | 3-1/2 inch double-sided drive; 1.44 megabyte capacity. |
| 2.88M, 3.5 in. | 3-1/2 inch double-sided drive; 2.88 megabyte |

| | |
|---|---|
| | capacity. |

- Floppy 3 Mode Support

| | |
|---|---|
| Disabled | No 3 mode floppy drive installed. |
| Drive A | Installed 3 mode drive at drive A. |
| Drive B | Installed 3 mode drive at drive B. |
| Both | Installed 3 mode drive at drive A and drive B. |

- Video

  The category detects the type of adapter used for the primary system monitor that must match your video display card and monitor. Although secondary monitors are supported, you do not have to select the type in setup.

| | |
|---|---|
| EGA/VGA | Enhanced Graphics Adapter/Video Graphics Array. For EGA, VGA, SVGA, or PGA monitor adapters |
| CGA 40 | Color Graphics Adapter, power up in 40 column mode |
| CGA 80 | Color Graphics Adapter, power up in 80 column mode |
| MONO | Monochrome adapter, includes high resolution monochrome adapters |

- Halt on

  The category determines whether the computer will stop if an error is detected during power up.

| | |
|---|---|
| NO errors | The system boot will not be stopped for any error that may be detected |
| All errors | Whenever the BIOS detects a non-fatal error the system will be stopped and you will be prompted |
| All,But Keyboard | The system boot will not stop for a keyboard error; it will stop for all other errors |
| All, But Diskette | The system boot will not stop for a disk error; it will stop for all other errors |
| All, But Disk/Key | The system boot will not stop for a keyboard or disk error; it will stop for all other errors |

- Memory

  The category is display-only which is determined by POST (Power On Self Test) of the BIOS.

  **Base Memory**

  The POST of the BIOS will determine the amount of base (or conventional) memory installed in the system. The value of the base memory is typically 512K for systems with 512K memory installed on the motherboard, or 640K for systems with 640K or

more memory installed on the motherboard.

**Extended Memory**

The BIOS determines how much extended memory is presented during the POST. This is the amount of memory located above 1MB in the CPU's memory address map.

**Expanded Memory**

Expanded Memory is defined by the Lotus/Intel/Microsoft (LIM) standard as EMS. Many standard DOS applications can not utilize memory above 640K. The Expanded Memory Specification (EMS) swaps memory which is not utilized by DOS with a section, or frame, so these applications can access all of the system memory. Memory which can be swapped by EMS is usually 64K within 1MB or memory above 1MB, depending on the chipset design.

Expanded memory device driver is required to use memory as Expanded Memory.

**Other Memory**

This refers to the memory located in the 640K to 1024 K address space. This is memory that can be used for different applications. DOS uses this area to load device drivers to keep as much base memory free for application programs. Most usage for this area is Shadow RAM.

## 4.6. BIOS FEATURES SETUP

ROM PCI / ISA BIOS
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 | | |
| Security Option | : Setup | | |
| PCI/VGA Palette Snoop | : Disabled | | |
| OS Select For DRAM >64MB | : Non-OS2 | | |

ESC : Quit ↑ ↓ → ← : Select Item
F1 : Help PU/PD/+/- : Modify
F5 : Old Values (Shift)F2 : Color
F6 : Load BIOS Defaults
F7 : Load Setup Defaults

Figure 4.3: BIOS Features Setup

- Virus Warning

  This category 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 the following error message will appear. In the mean time, you can run anti-virus program to locate the problem. Default value is Disabled.

| | |
|---|---|
| Enabled | Activate automatically when anything attempts to access the boot sector or hard disk partition table. Which is informed by a warning message. |
| Disabled | No warning message appears when anything attempts to access the boot sector or hard disk partition table |

- CPU Internal Cache / External Cache

  These two categories speed up memory access. However, it depends on CPU / chipset design. The default value is Enabled.

| | |
|---|---|
| Enabled | Enable cache function. |
| Disabled | Disable cache function. |

- Quick Power On Self Test

  This category speeds up Power On Self Test (POST) after you power on the computer. If it is set to Enable, BIOS will skip some check items during POST. The default value is Enabled.

| | |
|---|---|
| Enabled | Enable quick POST |
| Disabled | Normal POST |

- Boot Sequence

  This category determines which drive computer searches first for the disk operating system (i.e., DOS). Default value is A,C.

| | |
|---|---|
| A,C | System will first search for floppy disk drive then hard disk drive. |
| C,A | System will first search for hard disk drive then floppy disk drive. |

- Swap Floppy Drive

  The default value is Disabled.

| | |
|---|---|
| Enabled | Floppy A & B will be swapped under DOS |
| Disabled | Floppy A & B will be normal definition |

- Boot Up Floppy Seek

  During POST, BIOS will determine if the floppy disk drive installed is 40 or 80 tracks. 360 KB type is 40 tracks while 720 KB, 1.2 MB, 1.44 MB and 2.88 MB are all 80 tracks. The default value is Enabled.

| | |
|---|---|
| Enabled | BIOS searches for floppy disk drive to determine if it is 40 or 80 tracks, Note that BIOS can not tell from 720 KB, 1.2 MB, 1.44 MB and 2.88 MB drive type as they are all 80 tracks. |
| Disabled | BIOS will not search for the type of floppy disk drive by track number. Note that there will not be any warning message if the drive installed is 360 KB. |

- Boot Up NumLock Status

  The default value is On.

| | |
|---|---|
| On | Keypad is number keys |
| Off | Keypad is arrow keys |

- Security Option

  This category allows you to limit access to the system and Setup, or just to Setup. The default value is Setup.

| | |
|---|---|
| System | The system will not boot and access to Setup will be denied if the correct password is not entered at the prompt |
| Setup | The system will boot, but access to Setup will be denied if the correct password is not entered at the prompt |

**To disable security, select PASSWORD SETTING at Main Menu and then you will be asked to enter password. If the user does not type anything and just press <Enter>, it will disable security. Once the security is disabled, the system will boot and you can enter Setup freely.**

- PCI/VGA Palette Snoop

  The default value is Disabled.

| | |
|---|---|
| Enabled | For having Video Card on ISA BUS and VGA Card on PCI BUS. |
| Disabled | For VGA Card only. |

- OS Select For DRAM>64MB

  The default value is Non-OS2.

| | |
|---|---|
| Non-OS2 | Using non-OS2 operating system. |
| OS2 | Using OS2 operating system and DRAM>64MB. |

- Video BIOS Shadow

  It determines whether video BIOS will be copied to RAM, however, it is optional from chipset design. Video Shadow will increase the video speed. The default value is Enable.

| | |
|---|---|
| Enabled | Video shadow is enabled. |
| Disabled | Video shadow is disabled. |

- C8000 - CFFFF Shadow / D0000 - DFFFF Shadow

  These categories determine whether optional ROM will be copied to RAM by 16 K byte. The default value are Disabled.

| | |
|---|---|
| Enabled | Optional shadow is enabled. |
| Disabled | Optional shadow is disabled. |

## 4.7. CHIPSET FEATURES SETUP

ROM PCI / ISA BIOS
CHIPSET FEATURES SETUP
AWARD SOFTWARE, INC.

| | | |
|---|---|---|
| | Auto Configuration | : Enabled |
| * | DRAM Timing | : 70 ns |
| | DRAM RAS# Precharge Time | : 4 |
| | DRAM R/W Leadoff Timing | : 7 |
| | Fast RAS To CAS Delay | : 3 |
| | DRAM Read Burst (EDO/FP) | : x222/x333 |
| | DRAM Write Burst Timing | : x333 |
| | Fast MA to RAS# Delay CLK | : 2 |
| | Refresh RAS# Assertion | : 5 CLKS |
| | ISA Bus Clock | : PCI CLK/4 |
| | Pipeline Cache Timing | : Faster |
| | System BIOS Cacheable | : Enabled |
| | Video BIOS Cacheable | : Enabled |
| | 8 Bit I/O Recovery Time | : 1 |
| | 16 Bit I/O Recovery Time | : 1 |
| | Memory Hole At 15M-16M | : Disabled |
| | Peer Concurrency | : Enabled |
| ** | SDRAM (CAS Lat/RAS-to CAS) | : 3/3 |

ESC : Quit ↑ ↓ → ← : Select Item
F1 : Help PU/PD/+/- : Modify
F5 : Old Values (Shift)F2 : Color
F6 : Load BIOS Defaults
F7 : Load Setup Defaults

Figure 4.4: Chipset Features Setup

* This option will show up if Auto configuration is been Enabled.

** This option will show up if SDRAM is using.

- Auto Configuration

  The default value is Enabled.

| | |
|---|---|
| Enabled | Enable auto configuration. |
| Disabled | Disable auto configuration. |

- DRAM Timing

  The default value is 70 ns.

| | |
|---|---|
| 60 ns | Using 60ns DRAM speed. |
| 70 ns | Using 70ns DRAM speed. |

- DRAM RAS# Precharge Time

  The default value is 4.

| | |
|---|---|
| 3 | Set DRAM RAS# precharge time to 3. |
| 4 | Set DRAM RAS# precharge time to 4. |

- DRAM R/W Leadoff Timing

  The default value is 7.

| | |
|---|---|
| 7 | Set DRAM R/W leadoff timing to 7. |
| 6 | Set DRAM R/W leadoff timing to 6. |

- Fast RAS To CAS Delay

  The default value is 3.

| | |
|---|---|
| 2 | Set Fast RAS to CAS delay to 2. |
| 3 | Set Fast RAS to CAS delay to 3. |

- DRAM Read Burst (EDO/FP)

  The default value is x444/x444.

| | |
|---|---|
| x444/x444 | Set DRAM read burst to x444/x444. |
| x333/x444 | Set DRAM read burst to x333/x444. |
| x222/x333 | Set DRAM read burst to x222/x333. |

- DRAM write Burst timing

  The default value is x444.

| | |
|---|---|
| x222 | Set DRAM write burst timing to x222. |
| x333 | Set DRAM write burst timing to x333. |
| x444 | Set DRAM write burst timing to x444. |

- Fast MA to RAS# Delay CLK

  The default value is 2.

| | |
|---|---|
| 2 | Set Fast MA to RAS# Delay 2 CLK. |
| 1 | Set Fast MA to RAS# Delay 1 CLK. |

- Refresh RAS# Assertion

The default value is 5 CLKS.

| | |
|---|---|
| 4 | Set Refresh RAS# Assertion to 4 CLKS |
| 5 | Set Refresh RAS# Assertion to 5 CLKS |

- ISA Bus Clock

The default value is PCICLK/3.

| | |
|---|---|
| PCICLK/3 | For 50 MHz system. |
| PCICLK/4 | For 66,60 MHz system. |

- Pipeline Cache Timing

The default value is Faster.

| | |
|---|---|
| Faster | Set Pipeline Cache Timing to Faster. |
| Fastest | Set Pipeline Cache Timing to Fastest. |

- System BIOS Cacheable

The default value is Enabled.

| | |
|---|---|
| Enabled | Enable system BIOS cacheable. |
| Disabled | Disable system BIOS cacheable. |

- Video BIOS Cacheable

The default value is Enabled.

| | |
|---|---|
| Enabled | Enable video BIOS cacheable. |
| Disabled | Disable video BIOS cacheable. |

- 8 Bit I/O Recovery Time

The default value is 1.

| | |
|---|---|
| 1~8 | Set 8 Bit I/O recovery time from 1 to 8. |
| NA | None. |

- 16 Bit I/O Recovery Time

The default value is 1.

| | |
|---|---|
| 1~4 | Set 16 Bit I/O recovery time from 1 to 4. |
| NA | None. |

- Memory Hole At 15M-16M

The default value is Disabled.

| | |
|---|---|
| Disabled | Normal Setting. |
| Enabled | Set Address=15~16MB relocate to ISA BUS. |

- Peer Concurrency

The default value is Enabled.

| | |
|---|---|
| Disabled | Disable peer concurrency. |
| Enabled | Enable peer concurrency. |

- SDRAM (CAS Lat/RAS-to CAS)

The default value is 3/3.

| | |
|---|---|
| 3/3 | SDRAM (CAS Lat/RAS-to CAS) is 3/3. |
| 3/2 | SDRAM (CAS Lat/RAS-to CAS) is 3/2. |
| 2/2 | SDRAM (CAS Lat/RAS-to CAS) is 2/2. |

## 4.8. POWER MANAGEMENT SETUP

ROM PCI / ISA BIOS
POWER MANAGEMENT SETUP
AWARD SOFTWARE, INC.

| | |
|---|---|
| Power Management | : Enabled |
| PM Control by APM | : Yes |
| Video Off Method | : DPMS |
| Standby Mode | : Disabled |
| Suspend Mode | : Disabled |
| HDD Power Down | : Disabled |

** Wake Up Events In Standby **

| | | |
|---|---|---|
| IRQ3 | (Wake-Up Event) | : ON |
| IRQ4 | (Wake-Up Event) | : ON |
| IRQ12 | (Wake-Up Event) | : ON |

** Power Down & Resume Events **

| | | |
|---|---|---|
| IRQ3 | (COM 2) | : ON |
| IRQ4 | (COM 1) | : ON |
| IRQ5 | (LPT 2) | : OFF |
| IRQ6 | (Floppy Disk) | : ON |
| IRQ7 | (LPT 1) | : OFF |
| IRQ9 | (IRQ2 Redir) | : OFF |
| IRQ10 | (Reserved) | : OFF |
| IRQ11 | (Reserved) | : ON |
| IRQ12 | (PS/2 Mouse) | : ON |
| IRQ14 | (Hard Disk) | : ON |
| IRQ15 | (Reserved) | : ON |

ESC : Quit ↑ ↓ → ← : Select Item
F1 : Help PU/PD/+/- : Modify
F5 : Old Values (Shift)F2 : Color
F6 : Load BIOS Defaults
F7 : Load Setup Defaults

Figure 4.5: Power Management Setup

- Power Management

The default value is Enabled.

| | |
|---|---|
| Enabled | Enable Green function. |
| Disabled | Disable Green function. |

Please disable Green Function for Non-S CPU in OS/2, Unix, Window NT & Novell system.

- PM Control by APM

The default value is Yes.

| | |
|---|---|
| Yes | Enable software APM function. |
| No | Disable software APM function. |

- Video off Method

The default value is DPMS.

| | |
|---|---|
| V/H SYNC+Blank | BIOS will turn off V/H-SYNC when gets into Green mode for Green monitor power saving. |
| Blank Screen | BIOS will only black monitor when gets into Green mode. |
| DPMS | BIOS will use DPMS Standard to control VGA card. (The Green type VGA card will turn of V/H-SYNC automatically.) |

- Standby Mode

The default value is Disable.

| | |
|---|---|
| Disable | Disable Standby Mode. |
| 1 min - 1 Hour | Setup the timer to enter Standby Mode. |

- Suspend mode

The default value is Disable.

| | |
|---|---|
| Disable | Disable Suspend Mode. |
| 1 min - 1 Hour | Setup the timer to enter Suspend Mode. |

- HDD Power Down

The default value is Disable.

| | |
|---|---|
| Disable | Disable HDD Power Down mode function. |
| 1-15 mins | Enable HDD enter Power Down mode between 1 to 15 mins. |

- IRQX ( 3,4,5,6,7,9,10,11,12,14,15 )

The default value is On.

| | |
|---|---|
| On | The system will return to normal mode from Green Mode when the IRQX is active. |
| Off | The system will not return to normal mode from Green Mode when the IRQX is active. |

## 4.9. PNP/PCI CONFIGURATION

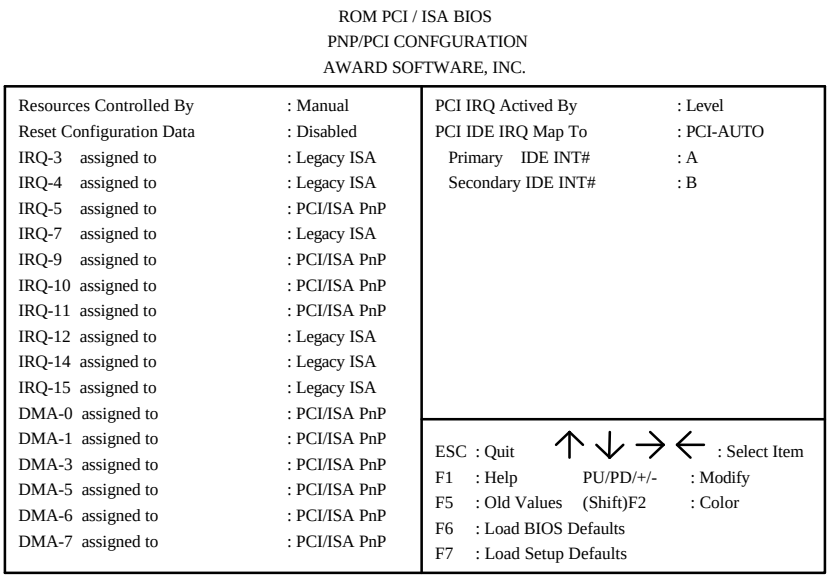



Figure 4.6: PNP/PCI Configuration

- Resources Controlled By

  The default value is Manual.

| | |
|---|---|
| Manual | Disable resources controlled. |
| Auto | Enable resources controlled. |

- Reset Configuration Data

  The default value is Disabled.

| | |
|---|---|
| Disabled | Disable reset configuration data. |
| Enabled | Enable reset configuration data. |

- Assigned to IRQ(3,4,5,7,9,10,11,12,14,15) / DMA (0,1,3,5,6,7)

| | |
|---|---|
| Legacy ISA | Assigned IRQX/DMAX to ISA Bus. |
| PCI/ISA PnP | Assigned IRQX/DMAX to PCI/ISA Bus with PnP function. |

- PCI IRQ Actived By

| | |
|---|---|
| Level | For some PCI SCSI or Lan device using same PCI INT. |
| Edge | Normal operating. |

- PCI IDE IRQ Map To

| | |
|---|---|
| PCI-Auto | Map PCI IDE IRQ to PCI slot automatically. |
| ISA | Map PCI IDE IRQ to ISA slot. |
| PCI-Slot1~PCI-Slot4 | Map PCI IDE-IRQ to PCI-Slot1~PCI-Slot4. |

- Primary/Secondary IDE INT#

| | |
|---|---|
| A | Set INTA for primary/secondary PCI IDE. |
| B | Set INTB for primary/secondary PCI IDE. |
| C | Set INTC for primary/secondary PCI IDE. |
| D | Set INTD for primary/secondary PCI IDE. |

## 4.10. LOAD BIOS DEFAULTS

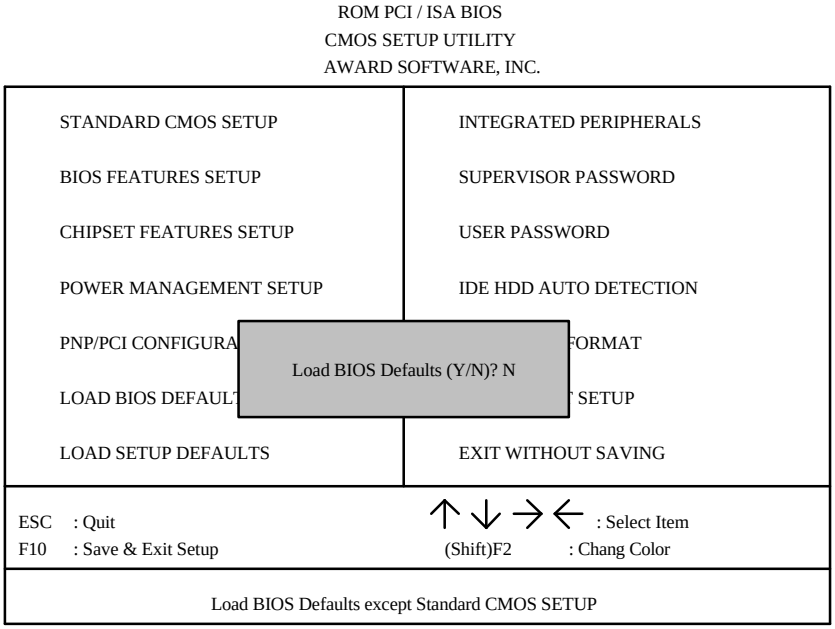



Figure 4.7: Load BIOS Defaults

- Load BIOS Defaults

  To load SETUP defaults value to CMOS SRAM, enter "Y". If not, enter "N".

## 4.11. LOAD SETUP DEFAULTS

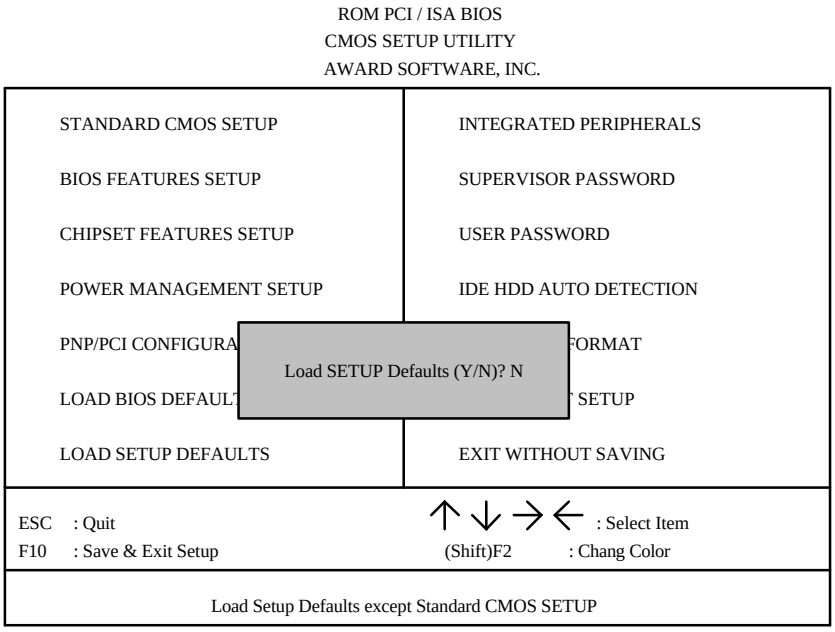



Figure 4.8: Load Setup Defaults

- Load SETUP Defaults

  To load SETUP defaults value to CMOS SRAM, enter "Y". If not, enter "N".

- **If there is any problem occurred, loading SETUP DEFAULTS step is recommended.**

## 4.12. INTEGRATED PERIPHERALS

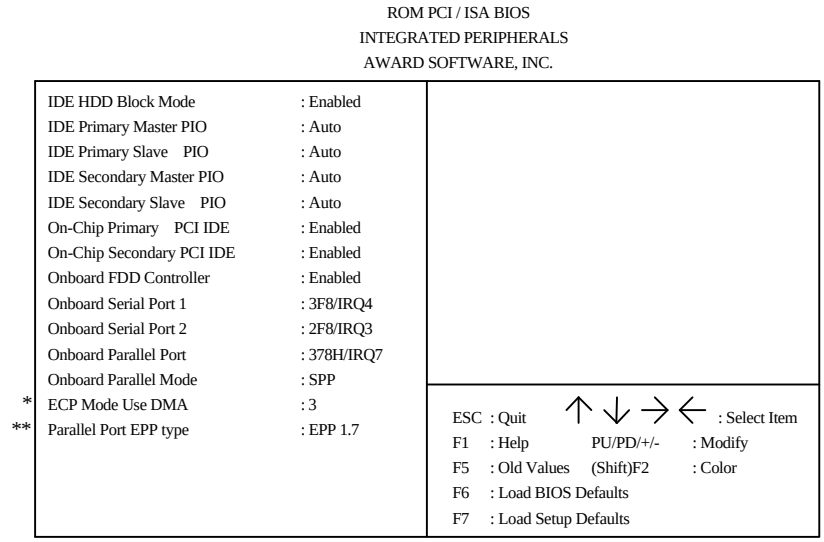



Figure 4.9: Integrated Peripherals

* This item will show up only if On board Parallel Mode set to ECP or ECP/EPP.

** This item will show up only if On board Parallel Mode set to EPP/SPP or ECP/EPP.

- IDE HDD Block Mode

  The default value is Enabled.

| | |
|---|---|
| Enabled | Enable IDE HDD Block Mode |
| Disabled | Disable IDE HDD Block Mode |

- IDE Primary Master PIO (for onboard IDE 1st channel).

  The default value is Auto.

| | |
|---|---|
| Auto | BIOS will automatically defect the IDE HDD Accessing mode. |
| Mode0~4 | Manually set the IDE Accessing mode. |

- IDE Primary Slave PIO (for onboard IDE 1st channel).

  The default value is Auto.

| | |
|---|---|
| Auto | BIOS will automatically defect the IDE HDD Accessing mode. |
| Mode0~4 | Manually set the IDE Accessing mode. |

- IDE Secondary Master PIO (for onboard IDE 2nd channel).

The default value is Auto.

| | |
|---|---|
| Auto | BIOS will automatically defect the IDE HDD Accessing mode. |
| Mode0~4 | Manually set the IDE Accessing mode. |

- IDE Secondary Slave PIO (for onboard IDE 2nd channel).

  The default value is Auto.

| | |
|---|---|
| Auto | BIOS will automatically defect the IDE HDD Accessing mode. |
| Mode0~4 | Manually set the IDE Accessing mode. |

- On-chip Primary/Secondary PCI IDE

  The default value is Enabled.

| | |
|---|---|
| Enabled | Enable On-chip Primary/Secondary PCI IDE. |
| Disabled | Disable On-chip Primary/Secondary PCI IDE. |

- Onboard FDD Controller

  The default value is Enabled.

| | |
|---|---|
| Enabled | Enable onboard FDD port. |
| Disabled | Disable onboard FDD port. |

- Onboard Serial Port 1

  The default value is 3F8/IRQ4.

| | |
|---|---|
| 3F8/IRQ4 | Enable onboard Serial port 1 and address is 3F8H. |
| 2F8/IRQ3 | Enable onboard Serial port 1 and address is 2F8H. |
| 3E8/IRQ4 | Enable onboard Serial port 1 and address is 3E8H. |
| 2E8/IRQ3 | Enable onboard Serial port 1 and address is 2E8H. |
| Disabled | Disable onboard Serial port 1. |

- Onboard Serial Port 2

  The default value is 2F8/IRQ3.

| | |
|---|---|
| 3F8/IRQ4 | Enable onboard Serial port 2 and address is 3F8H. |
| 2F8/IRQ3 | Enable onboard Serial port 2 and address is 2F8H. |
| 3E8/IRQ4 | Enable onboard Serial port 2 and address is 3E8H. |
| 2E8/IRQ3 | Enable onboard Serial port 2 and address is 2E8H. |
| Disabled | Disable onboard Serial port 2. |

- Onboard Parallel port

The default value is 378H/IRQ7.

| | |
|---|---|
| 3BCH/IRQ7 | Enable onboard LPT port and address is 3BCH/IRQ7. |
| 378H/IRQ7 | Enable onboard LPT port and address is 378H/IRQ7. |
| 278H/IRQ5 | Enable onboard LPT port and address is 278H/IRQ5. |
| Disabled | Disable onboard LPT port. |

- Parallel port Mode

  The default value is SPP.

| | |
|---|---|
| SPP | Using Parallel port as Normal Printer Port. |
| EPP/SPP | Using Parallel port as Enhanced Parallel Port/ Normal Printer Port.✸ |
| ECP | Using Parallel port as Extended Capabilities Port.❋ |
| ECP/EPP | Using Parallel port as ECP & EPP mode/Enhanced Parallel Port.❋ |

✸ As EPP/SPP Mode is selected, two options can be defined:

1. Parallel Port EPP type: EPP1.7
2. Parallel Port EPP type: EPP1.9

❋ As ECP,ECP/EPP Mode is selected, two options can be defined:

1. ECP Mode use DMA: 3
2. ECP Mode use DMA: 1

## 4.13. SUPERVISOR / USER PASSWORD

When you select this function, the following message will appear at the center of the screen to assist you in creating a password.

**ENTER PASSWORD**

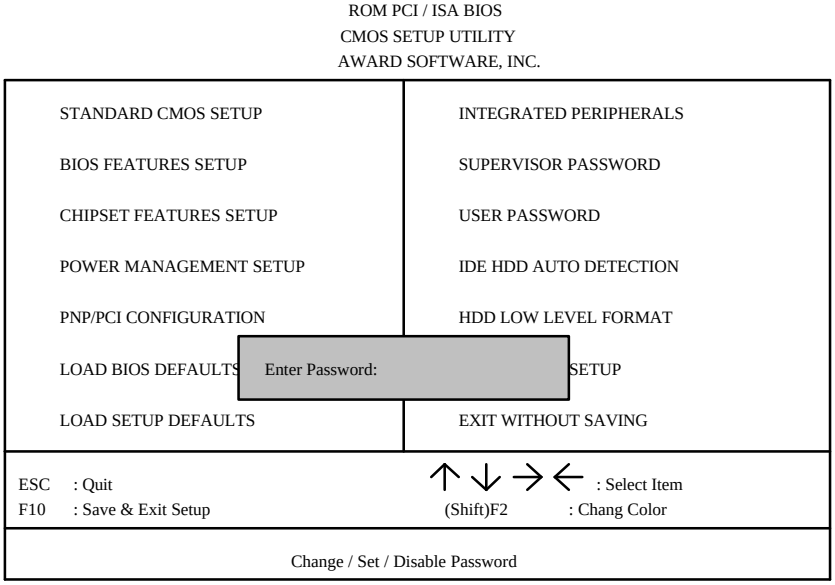



Figure 4.10: Supervisor / User Password

Type the password, up to eight characters, and press <Enter>. The password typed now will clear the previously entered password from CMOS memory. You will be asked to confirm the password. Type the password again and press <Enter>. You may also press <Esc> to abort the selection and not enter a password.

To disable password, just press <Enter> when you are prompted to enter password. A message will confirm the password being disabled. Once the password is disabled, the system will boot and you can enter Setup freely.

**PASSWORD DISABLED**

If you select System at Security Option of BIOS Features Setup Menu, you will be prompted for the password every time the system is rebooted or any time you try to enter Setup. If you select Setup at Security Option of BIOS Features Setup Menu, you will be prompted only when you try to enter Setup.

## 4.14. IDE HDD AUTO DETECTION

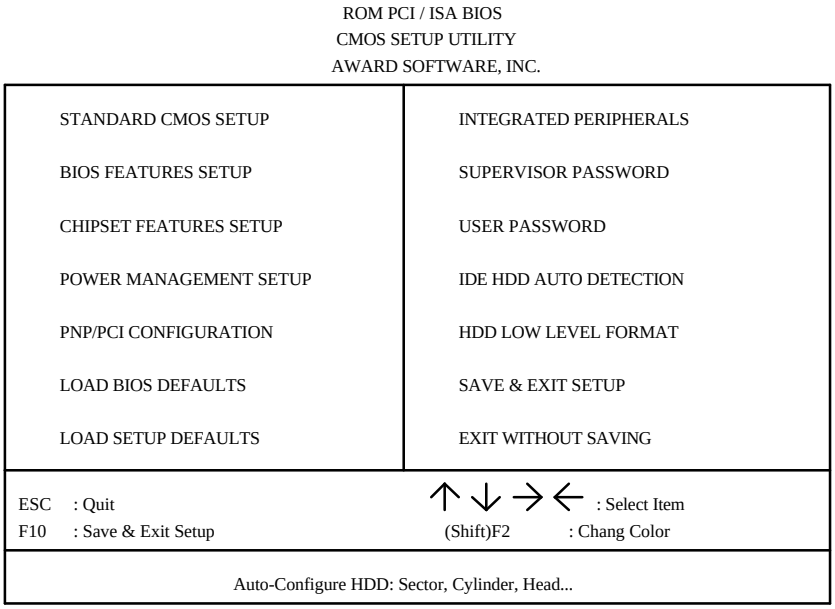



Figure 4.11: IDE HDD Auto Detection

Type "Y" will accept the H.D.D. parameter reported by BIOS.

Type "N" will keep the old H.D.D. parameter setup. If the hard disk cylinder NO. is over 1024, then the user can select LBA mode or LARGER mode for DOS partition LARGE than 528 MB.

## 4.15. HDD LOW LEVEL FORMAT

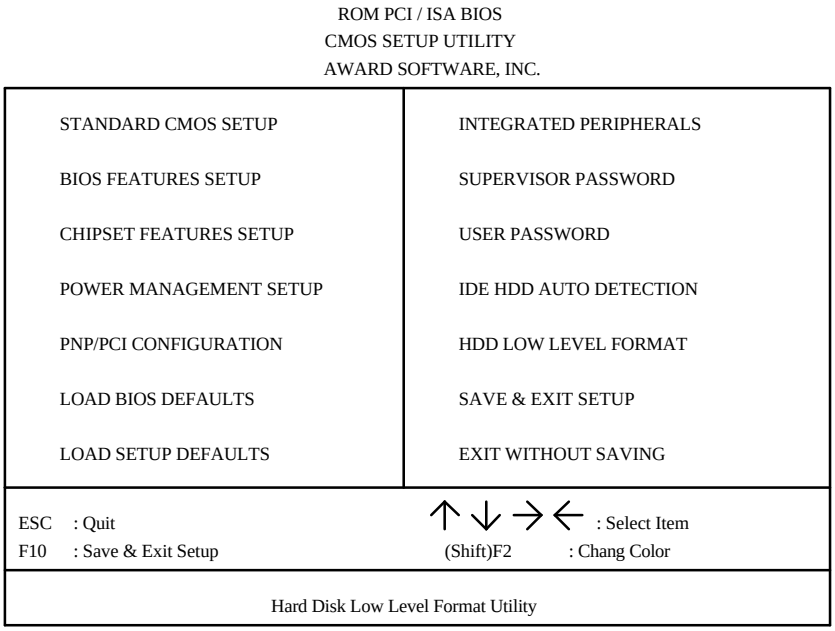



Figure 4.12: HDD Low Level Format

HDD Low Level Format Utility:

In main manual: There are three options to choose:

one is: SELECT DRIVE: "C" or "D".

another one is: BAD TRACK LIST: User can auto, add, modify, delete, clear for bad track of HDD.

the other one is : PREFORMAT: Lower Level Format HDD.

## 4.16. SAVE & EXIT SETUP

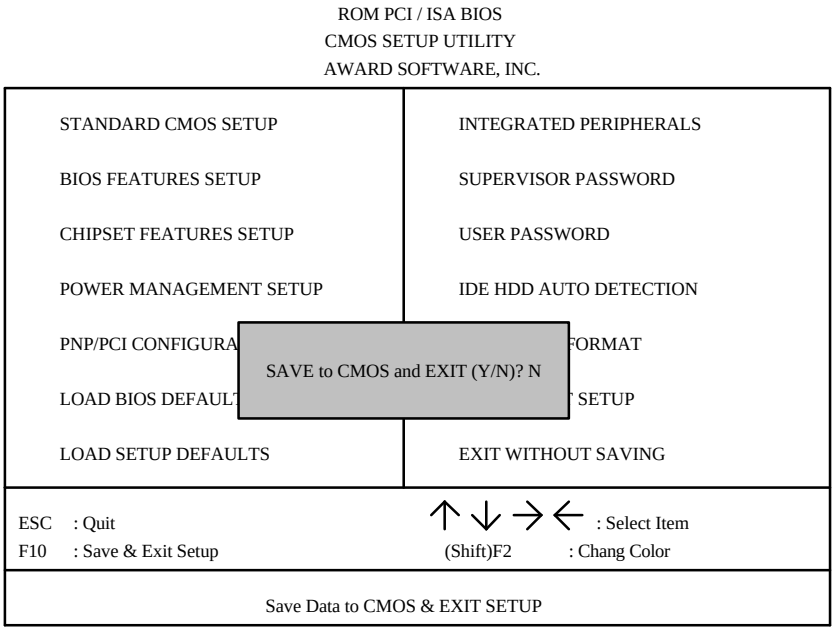



Figure 4.13: Save & Exit Setup

Type "Y" will quit the Setup Utility and save the user setup value to RTC CMOS SRAM.

Type "N" will return to Setup Utility.

## 4.17. EXIT WITHOUT SAVING

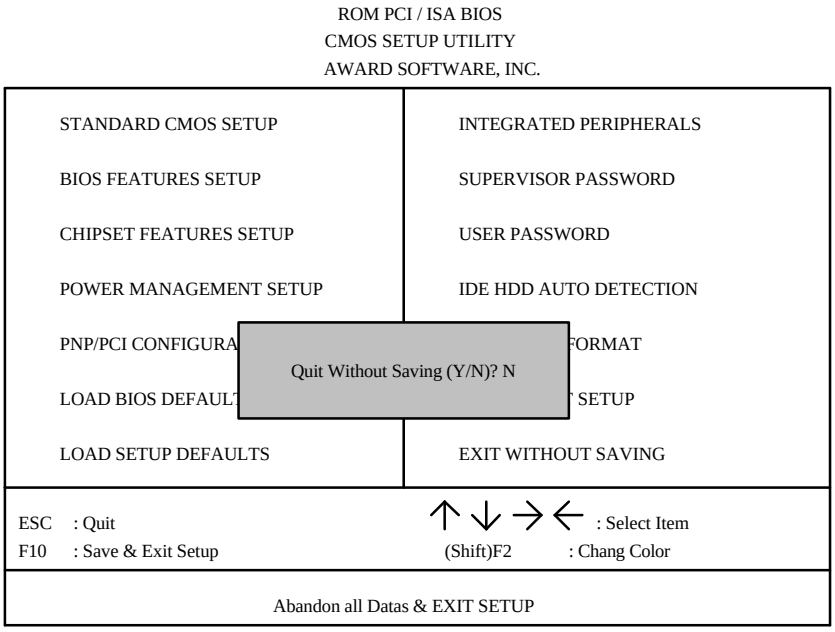



Figure 4.15: Exit Without Saving

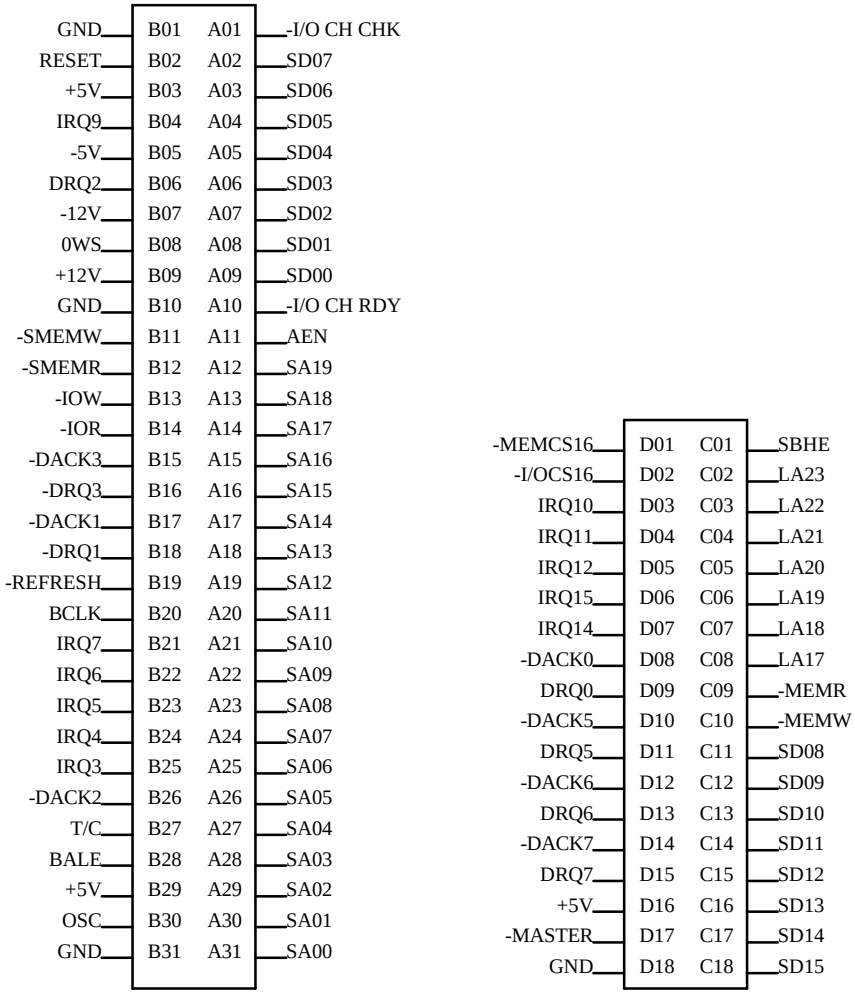
Type "Y" will quit the Setup Utility without saving to RTC CMOS SRAM.

Type "N" will return to Setup Utility.

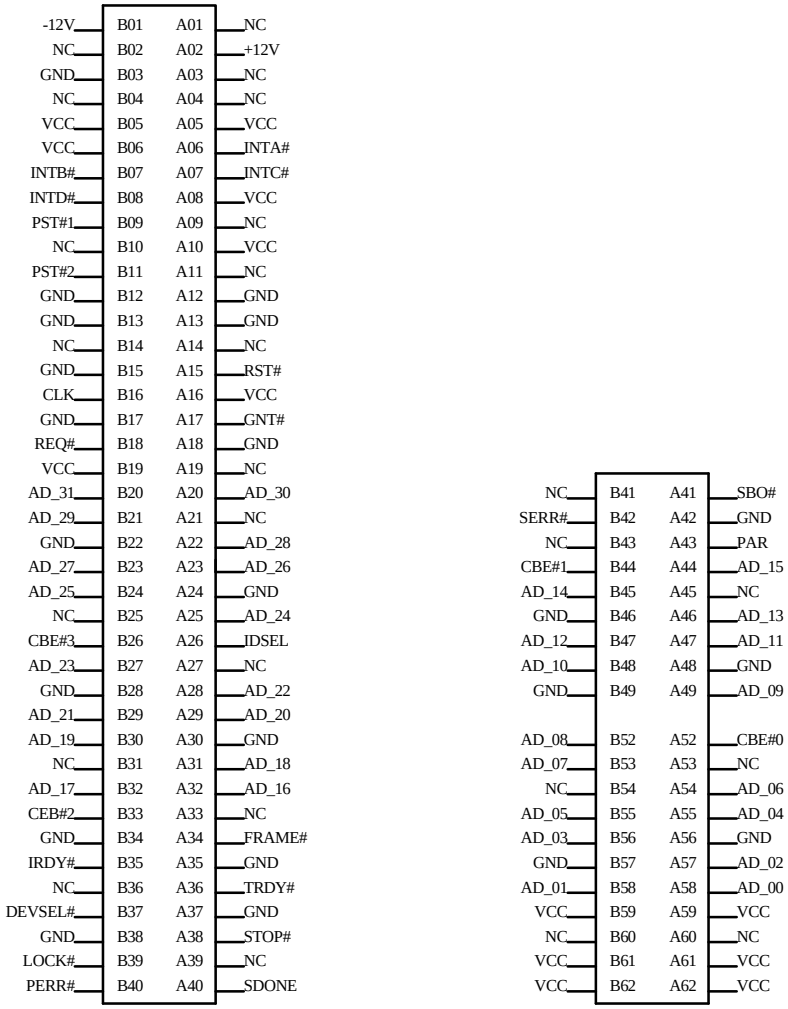
# 5. AT TECHNICAL INFORMATION

## 5.1. I/O BUS Enhanced Parallel Port CONNECTOR PIN OUT

### *5.1.1. ISA SLOT PIN OUT*



### *5.1.2. PCI - BUS SLOT PIN OUT*



| | | | |
|---|---|---|---|
| -12V | B01 | A01 | NC |
| NC | B02 | A02 | +12V |
| GND | B03 | A03 | NC |
| NC | B04 | A04 | NC |
| VCC | B05 | A05 | VCC |
| VCC | B06 | A06 | INTA# |
| INTB# | B07 | A07 | INTC# |
| INTD# | B08 | A08 | VCC |
| PST#1 | B09 | A09 | NC |
| NC | B10 | A10 | VCC |
| PST#2 | B11 | A11 | NC |
| GND | B12 | A12 | GND |
| GND | B13 | A13 | GND |
| NC | B14 | A14 | NC |
| GND | B15 | A15 | RST# |
| CLK | B16 | A16 | VCC |
| GND | B17 | A17 | GNT# |
| REQ# | B18 | A18 | GND |
| VCC | B19 | A19 | NC |
| AD_31 | B20 | A20 | AD_30 |
| AD_29 | B21 | A21 | NC |
| GND | B22 | A22 | AD_28 |
| AD_27 | B23 | A23 | AD_26 |
| AD_25 | B24 | A24 | GND |
| NC | B25 | A25 | AD_24 |
| CBE#3 | B26 | A26 | IDSEL |
| AD_23 | B27 | A27 | NC |
| GND | B28 | A28 | AD_22 |
| AD_21 | B29 | A29 | AD_20 |
| AD_19 | B30 | A30 | GND |
| NC | B31 | A31 | AD_18 |
| AD_17 | B32 | A32 | AD_16 |
| CEB#2 | B33 | A33 | NC |
| GND | B34 | A34 | FRAME# |
| IRDY# | B35 | A35 | GND |
| NC | B36 | A36 | TRDY# |
| DEVSEL# | B37 | A37 | GND |
| GND | B38 | A38 | STOP# |
| LOCK# | B39 | A39 | NC |
| PERR# | B40 | A40 | SDONE |

| | | | |
|---|---|---|---|
| NC | B41 | A41 | SBO# |
| SERR# | B42 | A42 | GND |
| NC | B43 | A43 | PAR |
| CBE#1 | B44 | A44 | AD_15 |
| AD_14 | B45 | A45 | NC |
| GND | B46 | A46 | AD_13 |
| AD_12 | B47 | A47 | AD_11 |
| AD_10 | B48 | A48 | GND |
| GND | B49 | A49 | AD_09 |
| | | | |
| AD_08 | B52 | A52 | CBE#0 |
| AD_07 | B53 | A53 | NC |
| NC | B54 | A54 | AD_06 |
| AD_05 | B55 | A55 | AD_04 |
| AD_03 | B56 | A56 | GND |
| GND | B57 | A57 | AD_02 |
| AD_01 | B58 | A58 | AD_00 |
| VCC | B59 | A59 | VCC |
| NC | B60 | A60 | NC |
| VCC | B61 | A61 | VCC |
| VCC | B62 | A62 | VCC |

## 5.2. I/O & MEMORY MAP

| | | |
|---|---|---|
| MEMORY MAP: | [0000000-009FFFF] | System memory used by DOS and application program. |
| | [00A0000-00BFFFF] | Display buffer memory for VGA/ EGA/CGA/MONOCHROME adapter. |
| | [00C0000-00DFFFF] | Reserved for I/O device BIOS ROM or RAM buffer. |
| | [00E0000-00EFFFF] | Reserved for PCI device ROM. |
| | [00F0000-00FFFFF] | System BIOS ROM. |
| | [0100000-BFFFFFF] | System extension memory. |
| I/O MAP: | [000-01F] | DMA controller.(Master) |
| | [020-021] | INTERRUPT controller.(Master) |
| | [022-023] | CHIPSET control registers I/O ports. |
| | [040-05F] | TIMER control registers. |
| | [060-06F] | KEYBOARD interface controller.(8042) |
| | [070-07F] | RTC ports & CMOS I/O ports. |
| | [080-09F] | DMA register. |
| | [0A0-0BF] | INTERRUPT controller.(Slave) |
| | [0C0-0DF] | DMA controller.(Slave) |
| | [0F0-0FF] | MATH COPROCESSOR |
| | [1F0-1F8] | HARD DISK controller. |
| | [278-27F] | PARALLEL port-2. |
| | [2B0-2DF] | GRAPHICS adapter controller. |
| | [2F8-2FF] | SERIAL port-2. |
| | [360-36F] | NETWORK ports. |
| | [378-37F] | PARALLEL port-1 |
| | [3B0-3BF] | MONOCHROME & PRINTER adapter. |
| | [3C0-3CF] | EGA adapter. |
| | [3D0-3DF] | CGA adapter. |
| | [3F0-3F7] | FLOPPY DISK controller. |
| | [3F8-3FF] | SERIAL port-1. |

## 5.3. TIMER & DMA CHANNELS MAP

TIMER MAP:
TIMER Channel-0 System timer interrupt
TIMER Channel-1 DRAM REFRESH request
TIMER Channel-2 SPEAKER tone generator

DMA CHANNELS:
DMA Channel-0 Available
DMA Channel-1 IBM SDLC
DMA Channel-2 FLOPPY DISK adapter
DMA Channel-3 Available
DMA Channel-4 Cascade for DMA controller 1
DMA Channel-5 Available
DMA Channel-6 Available
DMA Channel-7 Available

## 5.4. INTERRUPT MAP

NMI: Parity check error

IRQ (H/W):
0 System TIMER interrupt from TIMER-0
1 KEYBOARD output buffer full
2 Cascade for IRQ 8-15
3 SERIAL port 2
4 SERIAL port 1
5 PARALLEL port 2
6 FLOPPY DISK adapter
7 PARALLEL port 1
8 RTC clock
9 Available
10 Available
11 Available
12 PS/2 Mouse
13 MATH coprocessor
14 HARD DISK adapter
15 Available

## 5.5. RTC & CMOS RAM MAP

| | | |
|---|---|---|
| RTC & CMOS: | 00 | Seconds |
| | 01 | Second alarm |
| | 02 | Minutes |
| | 03 | Minutes alarm |
| | 04 | Hours |
| | 05 | Hours alarm |
| | 06 | Day of week |
| | 07 | Day of month |
| | 08 | Month |
| | 09 | Year |
| | 0A | Status register A |
| | 0B | Status register B |
| | 0C | Status register C |
| | 0D | Status register D |
| | 0E | Diagnostic status byte |
| | 0F | Shutdown byte |
| | 10 | FLOPPY DISK drive type byte |
| | 11 | Reserve |
| | 12 | HARD DISK type byte |
| | 13 | Reserve |
| | 14 | Equipment byte |
| | 15 | Base memory low byte |
| | 16 | Base memory high byte |
| | 17 | Extension memory low byte |
| | 18 | Extension memory high byte |
| | 19-2d | |
| | 2E-2F | |
| | 30 | Reserved for extension memory low byte |
| | 31 | Reserved for extension memory high byte |
| | 32 | DATE CENTURY byte |
| | 33 | INFORMATION FLAG |
| | 34-3F | Reserve |
| | 40-7f | Reserved for CHIPSET SETTING DATA |

# APPENDIX A: POST MESSAGE

When the BIOS encounters an error that requires the user to correct something, either a beep code will sound or a message will be displayed in a box in the middle of the screen and the message PRESS F1 TO CONTINUE, CTRL-ALT-ESC OR DEL TO ENTER SETUP will be shown in the information box at the bottom.

- POST BEEP

  Currently there is only one beep code in BIOS. This code indicates that a video error has occurred and the BIOS cannot initialize the video screen to display any additional information. This beep code consists of a single long beep followed by two short beeps.

- ERROR MESSAGE

  Once or more of the following messages may be displayed if the BIOS detects an error during the POST. This list includes message for both the ISA and the EISA BIOS.

⌦ CMOS BATTERY HAS FAILED

CMOS battery is no longer functional. It should be replaced.

⌦ CMOS CHECKSUM ERROR

Checksum of CMOS is incorrect. This can indicate that CMOS has become corrupt. This error may have been caused by a weak battery. Check the battery and replace if necessary.

⌦ DISK BOOT FAILURE, INSERT SYSTEM DISK AND PRESS ENTER

No boot device was found. Insert a system disk into Drive A: and press <Enter>. If you assumed the system would boot from the hard drive, make sure the controller is inserted correctly and all cables are properly attached. Also be sure the disk is formatted as a boot device. Then reboot the system.

⌦ DISKETTE DRIVES OR TYPES MISMATCH ERROR - RUN SETUP

Type of diskette drive installed in the system is different from the CMOS definition. Run Setup to re-configure the drive type correctly.

⌦ DISPLAY SWITCH IS SET INCORRECTLY

Display switch on the motherboard can be set to either monochrome or color. This indicates the switch is set to a different setting than indicated in Setup. Determine which setting is correct, and then either turn off the system and change the jumper, or enter Setup and change the VIDEO selection.

⌦ DISPLAY TYPE HAS CHANGED SINCE LAST BOOT

Since last powering off the system, the display adapter has been changed. You must configure the system for the new display type.

⌦ EISA Configuration Checksum Error

PLEASE RUN EISA CONFIGURATION UTILITY

The EISA non-volatile RAM checksum is incorrect or cannot correctly read the EISA slot. This can indicate either the EISA non-volatile memory has become corrupted or the slot has been configured incorrectly. Also be sure the card is installed firmly in the slot.

⌦ EISA Configuration Is Not Complete

PLEASE RUN EISA CONFIGURATION UTILITY

The slot configuration information stored in the EISA non-volatile memory is incomplete.

☞ When either of these errors appear, the system will boot in ISA mode, which allows you to run the EISA Configuration Utility.

⌦ ERROR ENCOUNTERED INITIALIZING HARD DRIVE

Hard drive cannot be initialized. Be sure the adapter is installed correctly and all cables are correctly and firmly attached. Also be sure the correct hard drive type is selected in Setup.

⌦ ERROR INITIALIZING HARD DISK CONTROLLER

Cannot initialize controller. Make sure the cord is correctly and firmly installed in the bus. Be sure the correct hard drive type is selected in Setup. Also check to see if any jumper needs to be set correctly in the hard drive.

⌦ FLOPPY DISK CNTRLR ERROR OR NO CNTRLR PRESENT

Cannot find or initialize the floppy drive controller. Make sure the controller is installed correctly and firmly. If there are no floppy drives installed, be sure the Diskette Drive selection in Setup is set to NONE.

⌦ Invalid EISA Configuration

PLEASE RUN EISA CONFIGURATION UTILITY

The non-volatile memory containing EISA configuration information was programmed incorrectly or has become corrupted. Re-run EISA configuration utility to correctly program the memory.

☞ When this error appears, the system will boot in ISA mode, which allows you to run the EISA Configuration Utility.

⌦ KEYBOARD ERROR OR NO KEYBOARD PRESENT

Cannot initialize the keyboard. Make sure the keyboard is attached correctly and no keys are being pressed during the boot.

If you are purposely configuring the system without a keyboard, set the error halt condition in Setup to HALT ON ALL, BUT KEYBOARD. This will cause the BIOS to ignore the missing keyboard and continue the boot.

⌦ Memory Address Error at ...

Indicates a memory address error at a specific location. You can use this location along with the memory map for your system to find and replace the bad memory chips.

⌦ Memory parity Error at ...

Indicates a memory parity error at a specific location. You can use this location along with the memory map for your system to find and replace the bad memory chips.

⌦ MEMORY SIZE HAS CHANGED SINCE LAST BOOT

Memory has been added or removed since the last boot. In EISA mode, use Configuration Utility to re-configure the memory configuration. In ISA mode, enter Setup and enter the new memory size in the memory fields.

⌦ Memory Verify Error at ...

Indicates an error verifying a value already written to memory. Use the location along with your system's memory map to locate the bad chip.

⌦ OFFENDING ADDRESS NOT FOUND

This message is used in conjunction with the I/O CHANNEL CHECK and RAM PARITY ERROR messages when the segment that has caused the problem cannot be isolated.

⌦ OFFENDING SEGMENT:

This message is used in conjunction with the I/O CHANNEL CHECK and RAM PARITY ERROR messages when the segment that has caused the problem has been isolated.

⌦ PRESS A KEY TO REBOOT

This will be displayed at the bottom screen when an error occurs that requires you to reboot. Press any key and the system will reboot.

⌦ PRESS F1 TO DISABLE NMI, F2 TO REBOOT

When BIOS detects a Non-maskable Interrupt condition during boot, this will allow you to disable the NMI and continue to boot. Or you can reboot the system, which will enable the NMI.

⌦ RAM PARITY ERROR - CHECKING FOR SEGMENT ...

Indicates a parity error in Random Access Memory.

⌦ Should Be Empty But EISA Board Found

PLEASE RUN EISA CONFIGURATION UTILITY

A valid board ID was found in a slot that was configured as having no board ID.

☞ When this error appears, the system will boot in ISA mode, which allows you to run the EISA Configuration Utility.

⌦ Should Have EI SA Board But Not Found

PLEASE RUN EISA CONFIGURATION UTILITY

The board installed is not responding to the ID request, or no board ID has been found in the indicated slot.

☞ When this error appears, the system will boot in ISA mode, which allows you to run the EISA Configuration Utility.

⌦ Slot Not Empty

Indicates that a slot designated as empty by the EISA Configuration Utility actually contains a board.

☞ When this error appears, the system will boot in ISA mode, which allows you to run the EISA Configuration Utility.

⌦ SYSTEM HALTED, (CTRL-ALT-DEL) TO REBOOT ...

Indicates the present boot attempt has been aborted and the system must be rebooted. Press and hold down the CTRL and ALT keys and press DEL.

⌦ Wrong Board In Slot

PLEASE RUN EISA CONFIGURATION UTILITY

The board ID does not match the ID stored in the EISA non-volatile memory.

☞ When this error appears, the system will boot in ISA mode, which allows you to run the EISA Configuration Utility.

# APPENDIX B: POST CODES

☞ EISA POST codes are typically output to port address 300h. ISA POST codes are typically output to port address 80h.

| POST | Name | Description |
|---|---|---|
| C0 | Turn Off Chipset Cache | OEM Specific-Cache control. |
| 1 | Processor Test 1 | Processor Status (1 FLAGS) Verification.<br>Test the following processor status flags carry, zero, sign, overflow,<br>The BIOS will set each of these flags, verify they are set, then turn each flag off and verify it is off. |
| 2 | Processor Test 2 | Read/Write/Verify all CPU registers except SS, SP, and BP with data pattern FF and 00. |
| 3 | Initialize Chips | Disable NMI, PIE, AIE, UEI, SQWV.<br>Disable video, parity checking, DMA.<br>Reset math coprocessor.<br>Clear all page registers, CMOS shutdown byte.<br>Initialize timer 0, 1, and 2, including set EISA timer to a known state.<br>Initialize DMA controllers 0 and 1.<br>Initialize interrupt controllers 0 and 1.<br>Initialize EISA extended registers. |
| 4 | Test Memory Refresh Toggle | RAM must be periodically refreshed in order to keep the memory from decaying. This function assures that the memory refresh function is working properly. |
| 5 | Blank video, Initialize keyboard | Keyboard controller initialization. |
| 6 | Reserved | |
| 7 | Test CMOS Interface and Battery Status | Verifies CMOS is working correctly, detects bad battery. |
| BE | Chipset Default Initialization | Program chipset registers with power on BIOS defaults. |
| C1 | Memory presence test | OEM Specific-Test to size on-board memory. |
| C5 | Early Shadow | OEM Specific-Early Shadow enable for fast boot. |
| C6 | Cache presence test | External cache size detection. |
| 8 | Setup low memory | Early chip set initialization.<br>Memory presence test.<br>OEM chip set routines.<br>Clear low 64 K of memory.<br>Test first 64 K memory. |

| | | |
|---|---|---|
| 9 | Early Cache Initialization | Cyrix CPU initialization.<br>Cache initialization. |
| A | Setup Interrupt Vector Table | Initialize first 120 interrupt vectors with SPURIOUS_INT-HDLR and initialize INT 00h-1Fh according to INT_TBL. |
| B | Test CMOS RAM Checksum | Test CMOS RAM Checksum, if bad, or insert key pressed, load defaults. |
| C | Initialize keyboard | Detect type of keyboard controller (optional).<br>Set NUM_LOCK status. |
| D | Initialize Video Interface | Detect CPU clock.<br>Read CMOS location 14h to find out type of video in use.<br>Detect and Initialize Video Adapter. |
| E | Test Video Memory | Test video memory, write sign-on message to screen.<br>Setup shadow RAM - Enable shadow according to Setup. |
| F | Test DMA Controller 0 | BIOS checksum test.<br>Keyboard detect and initialization. |
| 10 | Test DMA Controller 1 | |
| 11 | Test DMA Page registers | Test DMA Page Registers. |
| 12-13 | Reserved | |
| 14 | Test Timer Counter 2 | Test 8254 Timer 0 Counter 2. |
| 15 | Test 8259-1 Mask Bits | Verify 8259 Channel 1 masked interrupts by alternately turning off and on the interrupt lines. |
| 16 | Test 8259-2 Mask Bits | Verify 8259 Channel 2 masked interrupts by alternately turning off and on the interrupt lines. |
| 17 | Test Stuck 8259's Interrupt Bits | Turn off interrupts then verify no interrupt mask register is on. |
| 18 | Test 8259 Interrupt Functionality | Force an interrupt and verify the interrupt occurred. |
| 19 | Test Stuck NMI Bits (Parity/IO Check) | Verify NMI can be cleared. |
| 1A | | Display CPU clock. |
| 1B-1E | Reserved | |
| 1F | Set EISA Mode | If EISA non-volatile memory checksum is good, execute EISA initialization. If not, execute ISA tests an clear EISA mode flag.<br>Test EISA Configuration Memory Integrity (checksum & communication interface). |
| 20 | Enable Slot 0 | Initialize slot 0 (System Board). |
| 21-2F | Enable Slots 1-15 | Initialize slot 1 through 15. |

| | | |
|---|---|---|
| 30 | Size Base and Extended Memory | Size base memory from 256 K to 640 K extended memory above 1 MB. |
| 31 | Test Base and Extended Memory | Test base memory from 256 K to 640 K and extended memory above 1 MB using various patterns.<br>☞ This will be skipped in EISA mode and can be "skipped" with ESC key in ISA mode. |
| 32 | Test EISA Extended Memory | If EISA Mode flag is set then test EISA memory found in slots initialization.<br>☞ This will be skipped in ISA mode and can be "skipped" with ESC key in EISA mode. |
| 33-3B | Reserved | |
| 3C | Setup Enabled | |
| 3D | Initialize & Install Mouse | Detect if mouse is present, initialize mouse, install interrupt vectors. |
| 3E | Setup Cache Controller | Initialize cache controller. |
| 3F | Reserved | |
| BF | Chipset Initialization | Program chipset registers with Setup values. |
| 40 | | Display virus protest disable or enable. |
| 41 | Initialize Floppy Drive & Controller | Initialize floppy disk drive controller and any drives. |
| 42 | Initialize Hard Drive & Controller | Initialize hard drive controller and any drives. |
| 43 | Detect & Initialize Serial/Parallel Ports | Initialize any serial and parallel ports (also game port). |
| 44 | Reserved | |
| 45 | Detect & Initialize Math Coprocessor | Initialize math coprocessor. |
| 46 | Reserved | |
| 47 | Reserved | |
| 48-4D | Reserved | |
| 4E | Manufacturing POST Loop or Display Messages | Reboot if Manufacturing POST Loop pin is set. Otherwise display any messages (i.e., any non-fatal errors that were detected during POST) and enter Setup. |
| 4F | Security Check | Ask password security (optional). |
| 50 | Write CMOS | Write all CMOS values back to RAM and clear screen. |
| 51 | Pre-boot Enable | Enable parity checker.<br>Enable NMI, Enable cache before boot. |
| 52 | Initialize Option ROMs | Initialize any option ROMs present from C8000h to EFFFFh.<br>☞ When FSCAN option is enabled, will initialize from C8000h to F7FFFh. |
| 53 | Initialize Time | Initialize time value in 40h: BIOS area. |

| | Value | |
|---|---|---|
| 60 | Setup Virus Protect | Setup virus protect according to Setup |
| 61 | Set Boot Speed | Set system speed for boot |
| 62 | Setup NumLock | Setup NumLock status according to Setup |
| 63 | Boot Attempt | Set low stack.<br>Boot via INT 19h. |
| B0 | Spurious | If interrupt occurs in protected mode. |
| B1 | Unclaimed NMI | If unmasked NMI occurs, display<br>Press F1 to disable NMI, F2 reboot. |
| E1-EF | Setup Pages | E1 - Page 1, E2 - Page 2, etc. |
| FF | Boot | |

# APPENDIX C: BIOS DEFAULT DRIVE TABLE

| Type | Size (MB) | Cylinders | Heads | Sectors | Write / Precomp | Land Zone | Example Model |
|---|---|---|---|---|---|---|---|
| 1 | 10 MB | 306 | 4 | 17 | 128 | 305 | TEAC SD510 MMI 112, 5412 |
| 2 | 20 MB | 615 | 4 | 17 | 300 | 615 | Seagate ST225, ST4026 |
| 3 | 31 MB | 615 | 6 | 17 | 300 | 615 | |
| 4 | 62 MB | 940 | 8 | 17 | 512 | 940 | |
| 5 | 47 MB | 940 | 6 | 17 | 512 | 940 | |
| 6 | 20 MB | 615 | 4 | 17 | 65535 | 615 | Seagate ST125 Tandon TM262 |
| 7 | 31 MB | 462 | 8 | 17 | 256 | 511 | |
| 8 | 30 MB | 733 | 5 | 17 | 65535 | 733 | Tandon TM703 |
| 9 | 112 MB | 900 | 15 | 17 | 65535 | 901 | |
| 10 | 20 MB | 820 | 3 | 17 | 65535 | 820 | |
| 11 | 35 MB | 855 | 5 | 17 | 65535 | 855 | |
| 12 | 50 MB | 855 | 7 | 17 | 65535 | 855 | |
| 13 | 20 MB | 306 | 8 | 17 | 128 | 319 | Disctron526, MMI M125 |
| 14 | 43 MB | 733 | 7 | 17 | 65535 | 733 | |
| 16 | 20 MB | 612 | 4 | 17 | 0 | 663 | Microscience HH725 Syquest3250, 3425 |
| 17 | 41 MB | 977 | 5 | 17 | 300 | 977 | |
| 18 | 57 MB | 977 | 7 | 17 | 65535 | 977 | |
| 19 | 60 MB | 1024 | 7 | 17 | 512 | 1023 | |
| 20 | 30 MB | 733 | 5 | 17 | 300 | 732 | |
| 21 | 43 MB | 733 | 7 | 17 | 300 | 732 | |
| 22 | 30 MB | 733 | 5 | 17 | 300 | 733 | Seagate ST4038 |
| 23 | 10 MB | 306 | 4 | 17 | 0 | 336 | |
| 24 | 54 MB | 925 | 7 | 17 | 0 | 925 | Seagate ST4051 |
| 25 | 69 MB | 925 | 9 | 17 | 65535 | 925 | Seagate ST4096 |
| 26 | 44 MB | 754 | 7 | 17 | 754 | 754 | Maxtor2085 |
| 27 | 69 MB | 754 | 11 | 17 | 65535 | 754 | Maxtor2140, Priam S14 |
| 28 | 41 MB | 699 | 7 | 17 | 256 | 699 | Maxtor2190, Priam S19 |
| 29 | 68 MB | 823 | 10 | 17 | 65535 | 823 | Maxtor1085 Micropolis1325 |
| 30 | 53 MB | 918 | 7 | 17 | 918 | 918 | Maxtor1105, 1120, 4780 |
| 31 | 94 MB | 1024 | 11 | 17 | 65535 | 1024 | Maxtor1170 |
| 32 | 128 MB | 1024 | 15 | 17 | 65535 | 1024 | CDC9415 |
| 33 | 43 MB | 1024 | 5 | 17 | 1024 | 1024 | |
| 34 | 10 MB | 612 | 2 | 17 | 128 | 612 | |
| 35 | 77 MB | 1024 | 9 | 17 | 65535 | 1024 | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 36 | 68 MB | 1024 | 8 | 17 | 512 | 1024 | |
| 37 | 41 MB | 615 | 8 | 17 | 128 | 615 | |
| 38 | 25 MB | 987 | 3 | 17 | 987 | 987 | |
| 39 | 57 MB | 987 | 7 | 17 | 987 | 987 | Maxtor1140, 4380 |
| 40 | 41 MB | 820 | 6 | 17 | 820 | 820 | Seagate ST251 |
| 41 | 41 MB | 977 | 5 | 17 | 977 | 977 | Seagate ST4053 Miniscribe3053/ 6053 |
| 42 | 41 MB | 981 | 5 | 17 | 981 | 981 | Miniscribe3053/ 6053 RLL |
| 43 | 48 MB | 830 | 7 | 17 | 512 | 830 | Miniscribe 3650 |
| 44 | 69 MB | 830 | 10 | 17 | 65535 | 830 | Miniscribe 3650 RLL |
| 45 | 114 MB | 917 | 15 | 17 | 65535 | 918 | Conner CP3104 |
| 46 | 152 MB | 1224 | 15 | 17 | 65535 | 1223 | Conner CP3204 |
| User | | | | | | | |

# APPENDIX D: PROBLEM SHEET

**1. Customer Data**

Name
Address
Tel. No.
Fax. No.
Purchase Date

**2. Mainboard Date**

Model NO. GA-
Rev. No.
Serial No.

**3. System Configuration**

CPU Type:
CPU Brand:
CPU Speed:
DRAM Type: ❑ 1 ❑ 2 ❑ 4 ❑ 8 ❑ 16 ❑ 32 MB
DRAM Speed: ❑ 80 ❑ 70 ❑ 60 ns
DRAM Total Size: MB
DRAM Brand:
SRAM Size: ❑ 64KB ❑ 128 KB ❑ 256 KB ❑ 512 KB
SRAM Part No. TAG: DATA:
Video Card:
Video Chip or Brand:
Floppy Drive A Capacity & Brand:
Floppy Drive B Capacity & Brand:
Storage Controller Type ❑ MFM ❑ RLL ❑ IDE ❑ EDSI ❑ SCSI
Hard Drive C Brand & Type:
Hard Drive D Brand & Type:
LAN Controller Type:
LAN Card Brand & Model:
Serial / Parallel Chip Brand & Model:
Mouse Brand & Model:
O.S. ❑ DOS ❑ OS/2 ❑ NETWARE ❑ UNIX / XENIX Ver.:

**4. AUTOEXEC.BAT & CONFIG.SYS File:**

**5. Problem Description:**

R-11-04-061022