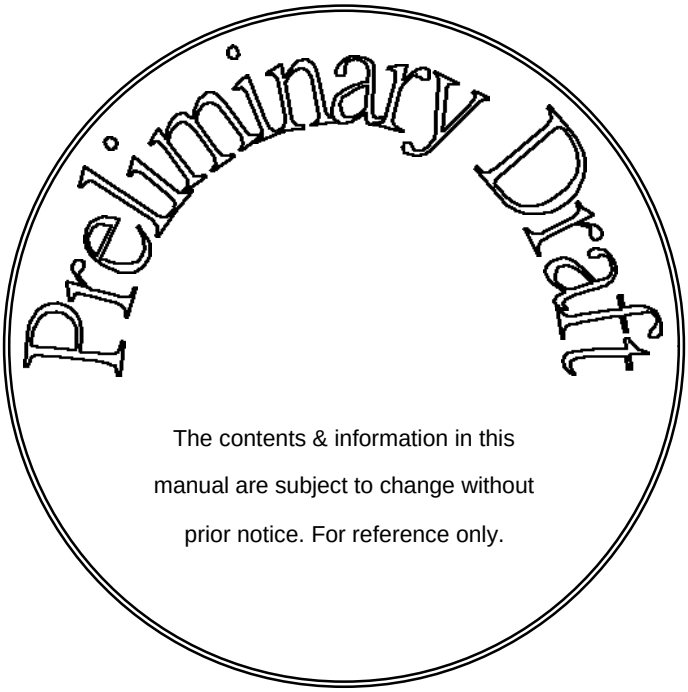
# *AP-545L*

**Single Board Computer**
**with VGA / LCD**
**for ZIF Socket 7 Processor**



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# CHAPTER 1.

## INTRODUCTION

The AP-545L is a half-size ISA single board computer for Socket 7 processor that is using the SIS' s BGA chipset SiS5582 that support the Ultra DMA-33 for faster hard drive, and USB function. For boosting operation, this motivated card also supports sockets for a Flash Disk and one DIMM memory module. It offers the function of an industrial computer on a single board with on-board 2nd level cache RAM of 512KB for maximum performance.

Take note that the AP-545L is a high power & full engine SBC with on-board function in the LCD/VGA display of resolution up to 1280 x 1024 at 256 colors. It provides the primarily elements for building an IBM PC/AT compatible computer for a wide variety of applications with system integration. The AP-545L is fully compatible with the IBM PC/AT which means virtually all the software written for the IBM PC/AT will run on the AP-545L SBC.

Other on-board features include two serial ports (one each of RS-232 and RS-232/422/485), one multi-mode parallel (ECP/EPP/SPP) port, a floppy drive controller and a keyboard interface and a PS/2 mouse interface. The built-in one high speed PCI IDE controller supports both PIO and bus master modes. Up to two IDE devices can be connected, including large hard disks, CD-ROM drives, tape backup drives and other IDE devices. Its 6-layer printed circuit board combines with noise-tolerant and low power consumption CMOS technology applied on the board makes AP-545L able to withstand any harsh industrial environments very well.

## 1.1 SPECIFICATIONS

- Processor : For ZIF Socket 7 Processor
  Intel Pentium® & MMX, AMD K5, K6 & K6-2, Cyrix 6x86 & M2 CPU
- Chipset : SiS 5582 Chipset, SMI 811 chip, Winbond 877TF chip compatible
- System Memory : One 168-pin DIMM socket up to 128MB SDRAM
- Cache Memory : On-board 512KB Pipelined Burst Synchronous cache
- BIOS : 256KB AMI License BIOS
- Flash Memory Disk : Reserved socket for DiskOnChip from M-System support up to 72 MB Flash Memory Disk
- LCD/VGA Controller : LCD/VGA on chipset SMI 811, on-board 2MB video memory
- IDE Drive Interface : One PCI IDE port, support up to two IDE devices and Ultra DMA-33
- Floppy Drive Interface : One FDD port, support up to two floppy devices
- Serial Port : Two COM ports, one RS-232 and one RS-232/422/485 serial ports
- Parallel Port : One multi-mode parallel port (SPP/EPP/ECP)
- Bus Interface : ISA bus
- RTC Battery : Dallas RTC battery or compatible
- DMA : 8 DMA channels
- Interrupts : 16 levels of hardware interrupts
- PS/2 Mouse & Keyboard Connector : On-board 6-pin Mini-Din PS/2 mouse & keyboard connector
- Expansion Bus : On-board PC/104 expansion connector
- Watchdog Timer : Software 16 level time-out intervals (0/2/4/6/8/10/12/14/16/18/20/22/24/26/28/30 sec.)
- Universal Serial Bus : Support 2 USB ports
- Operating Temperature : 0℃C~55℃C (32℃F~132℃F)
- Humidity : 10%~90% RH
- Dimensions : 185 mm X 122 mm ($7^1/_4$" X $4^5/_6$" inches)
- Net weight : 250 g (0.517 pounds)

## 1.2 PACKING CHECK LIST

Before you begin to install your card, please make sure that you received the following materials as listed below:

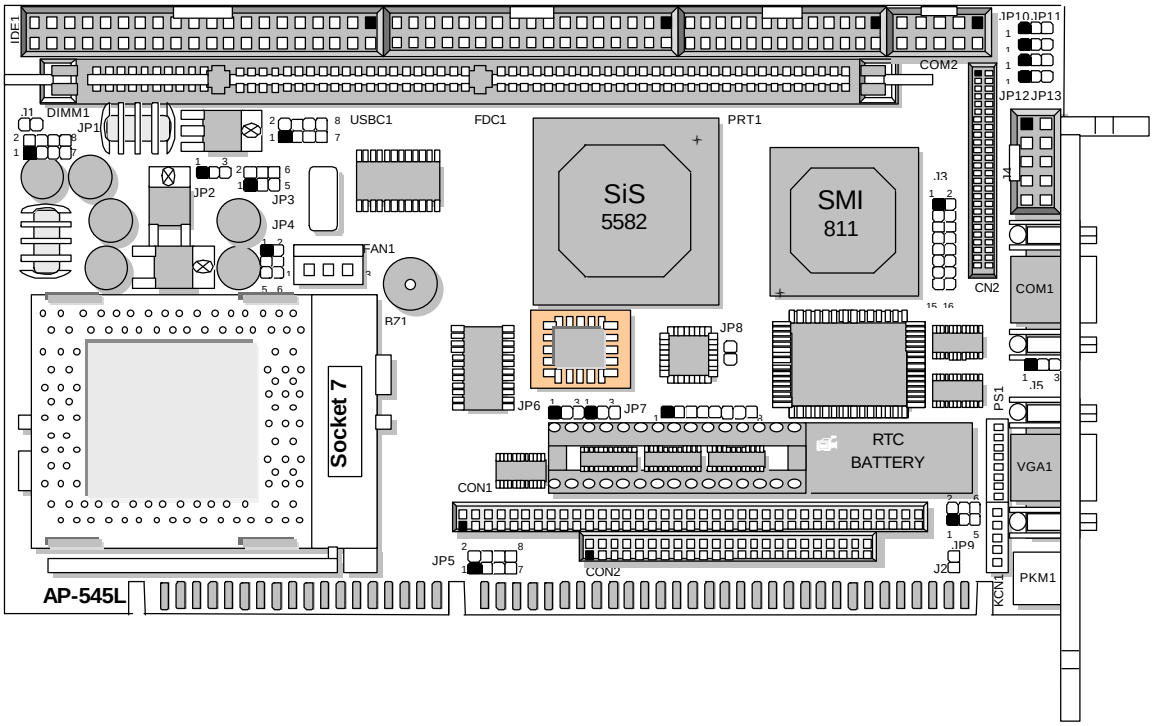
| *Item* | *Qty* | *Remark* |
|---|---|---|
| AP-545L Single Board Computer | 1 pc. | AP-545L SBC |
| Keyboard / Mouse adapter cable | 1 set | 6-pin PS/2 to 5-pin PS/2 keyboard / mouse connector |
| IDE / Floppy cable | 1 pc. | 40-pin standard header to 40-pin standard header<br>34-pin standard header to 34-pin standard header |
| Printer / COM port cable | 1 set | 26-pin female flat connector t header to 25-pin female D-Sub connector<br>10-pin standard flat header to 9-pin D-Sub cable |
| LCD/VGA / Utility Drivers | 1 pc. | CD-ROM diskette |
| User‘ s manual | 1 pc. | AP-545L user’ s manual |

# CHAPTER 2.

# JUMPER SETTINGS AND CONNECTORS

## 2.1 BOARD OUTLINE OF AP-545L

The Figure below shows the jumpers and connectors location on the AP-545L:



## 2.2 CPU INSTALLING AND UPGRADING

To upgrade to a higher power Pentium CPU, simply remove the old CPU and install to a new one; be sure to set the jumpers for the new CPU type and speed.

### *WARNING!*

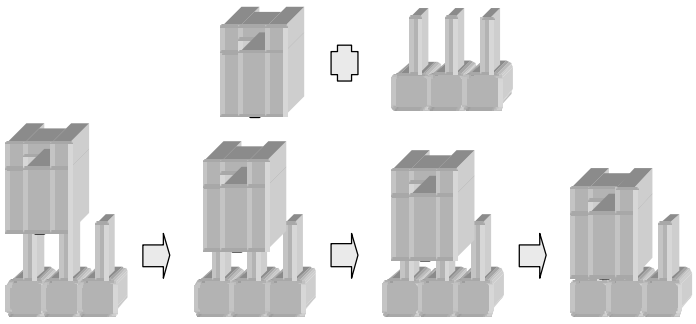
Disconnect the power cord from your system when you intend to work on it or you plan to open the chassis of your IPC. Do not make connections when the power is turned on as sensitive electronic components can be damaged by the sudden rush of power. Please only allow experienced electronics technicians to do this job.

### *STATIC ELECTRICITY PRECAUTION!*

Caution! Computer components are very sensitive to damage from static electric discharge. Always ground yourself to remove static charge build-up before touching the boards in the computer. Use a grounding wrist strap at all time. Place all electronic components on the anti-static pad for static-dissipation or in a static-shielded bag when they are not in the chassis.

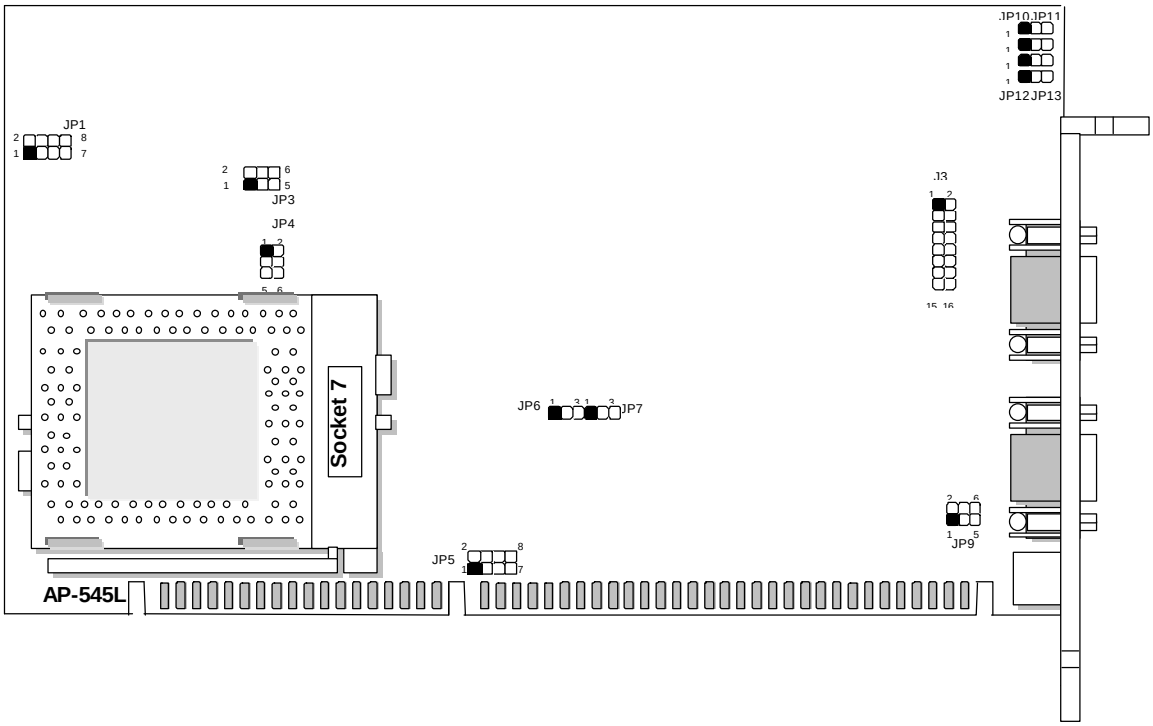
## 2.3 JUMPER SETTING OVERVIEW

In order to select the operation modes of your system, configure and set the jumpers on the your SBC to match the need of your application. To set a jumper, a black plastic cap containing metal contacts is placed over the jumper pins as designated by the required configuration as listed in this section. A jumper is said to be " on " or " 1-2 " when the black cap has been placed on two of its pins, as show in the figure below:



A pair of needle-nose pliers is recommended when working with jumpers. If you have any doubts about the best hardware configuration for your application, contact your local sales representative before you make any changes. In general, you simply need a standard cable to make most connections.

## 2.4 JUMPER LOCATION FOR AP-545L



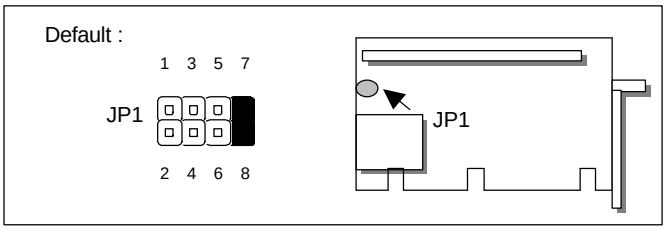
## 2.5 JUMPER SETTINGS SUMMARY FOR AP-545L

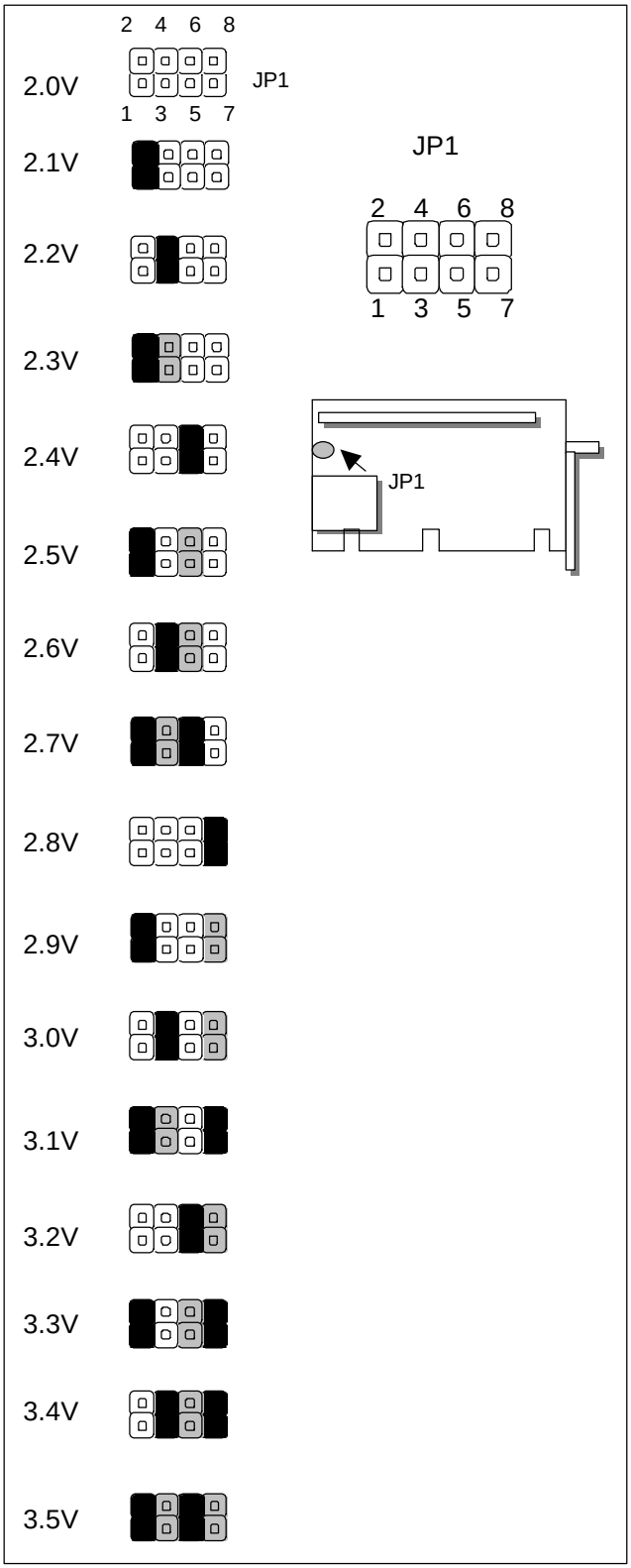
| JUMPERS | |
|---|---|
| **LOCATION** | **FUNCTION** |
| JP1 | Select CPU Vcore Voltage |
| JP3 | Select CPU External Bus Clock |
| JP4 | Select Internal CPU Clock Ratio |
| JP5 | Select Disk On Chip ( Flash Disk ) Address |
| JP6 ~ JP7 | Select ISP GAL Function |
| JP9 ~ JP13 | Select COM2 Type |
| J3 | Select Panel Type |

# 2.6 JUMPER SETTINGS FOR AP-545L

✦ **JP1 : Select Vcore Voltage**

| Vcore Voltage | JP1 |
|---|---|
| 2.0 V | OFF |
| 2.1 V | 1-2 |
| 2.2 V | 3-4 |
| 2.3 V | 1-2 , 3-4 |
| 2.4 V | 5-6 |
| 2.5 V | 1-2 , 5-6 |
| 2.6 V | 3-4 , 5-6 |
| 2.7 V | 1-2 , 3-4 , 5-6 |
| 2.8 V ( Default ) | 7-8 |
| 2.9 V | 1-2 , 7-8 |
| 3.0 V | 3-4 , 7-8 |
| 3.1 V | 1-2 , 3-4 , 7-8 |
| 3.2 V | 5-6 , 7-8 |
| 3.3 V | 1-2 , 5-6 , 7-8 |
| 3.4 V | 3-4 , 5-6 , 7-8 |
| 3.5 V | 1-2 , 3-4 , 5-6 , 7-8 |

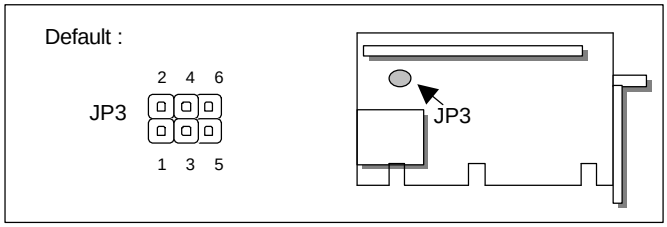


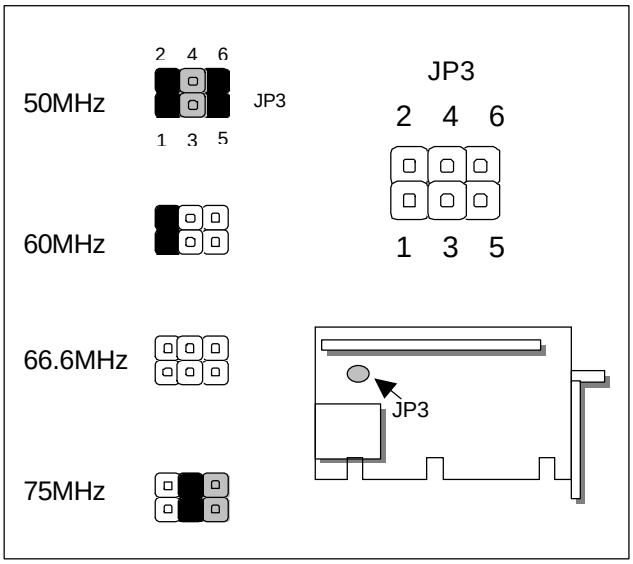



| CPU Speed Reference Table | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **CPU Speed (MHz)** | **75** | **90** | **100** | **120** | **133** | **150** | **166** | **200** | **233** |
| Clock setting | 50 | 60 | 66.6 | 60 | 66.6 | 60 | 66.6 | 66.6 | 66.6 |
| Frequency ratio | 1.5 | 1.5 | 1.5 | 2 | 2 | 2.5 | 2.5 | 3 | 3.5 |

✦ **JP3 : Select CPU External Bus Clock**

| **Phase Link PLL52C66-01 CPU External Bus Clock** | **JP3** |
|---|---|
| 50 MHz | 1-2 , 3-4 , 5-6 |
| 60 MHz | 1-2 |
| 66.6 MHz (Default ) | OFF |
| 75 MHz | 3-4 , 5-6 |

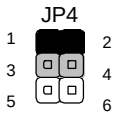


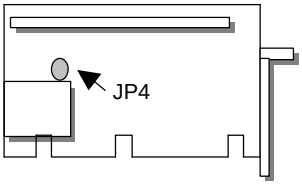



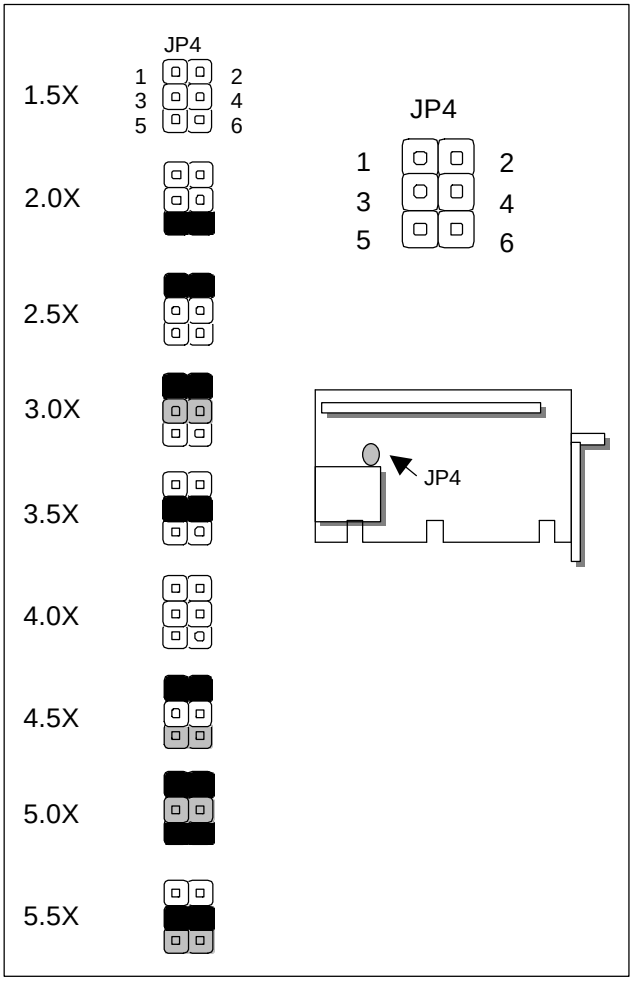
## ✦ JP4 : Select Internal CPU Clock Ratio

| Clock Ratio | JP4 |
|---|---|
| 1.5 X | OFF |
| 2.0 X | 1-2 |
| 2.5 X ( Default ) | 1-2 , 3-4 |
| 3.0 X | 3-4 |
| 3.5 X | OFF |
| 4.0 X | 1-2 , 5-6 |
| 4.5 X | 1-2 , 3-4 , 5-6 |
| 5.0 X | 3-4 , 5-6 |
| 5.5 X | 5-6 |

Default :



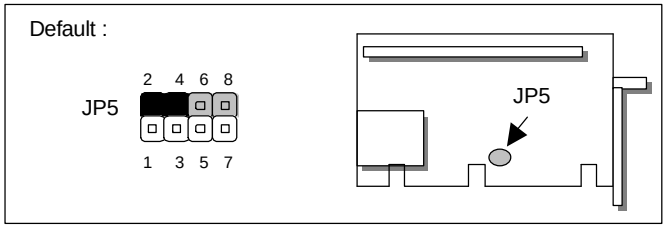



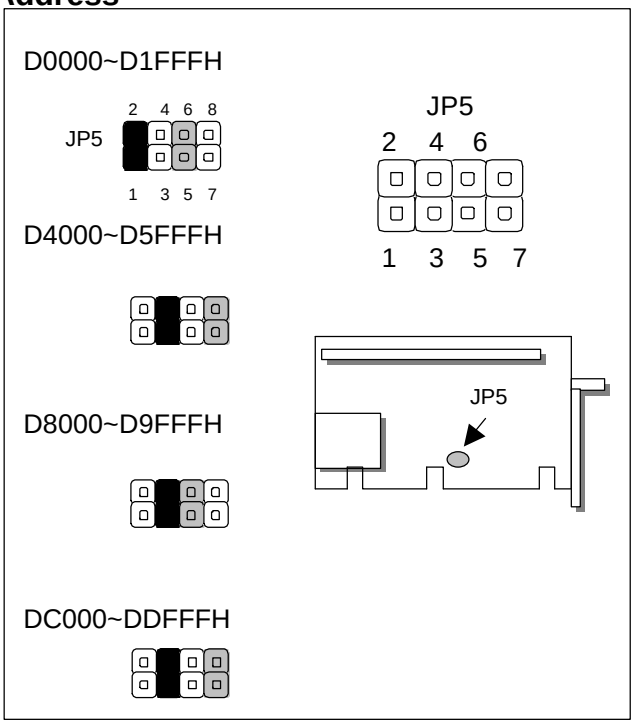



## ✦ JP5 : Select Disk On Chip ( Flash Disk ) Address

| Flash Disk Address | JP5 |
|---|---|
| D0000~D1FFFH | 1-2 , 5-6 |
| D4000~D5FFFH | 3-4 , 7-8 |
| D8000~D9FFFH | 3-4 , 5-6 |
| DC000~DDFFFH | 3-4 , 7-8 |

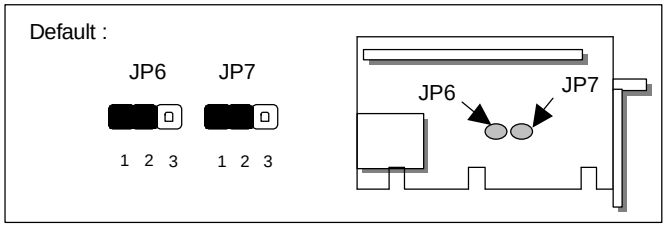
Note : Spare Jumper at 2-4 , 6-8

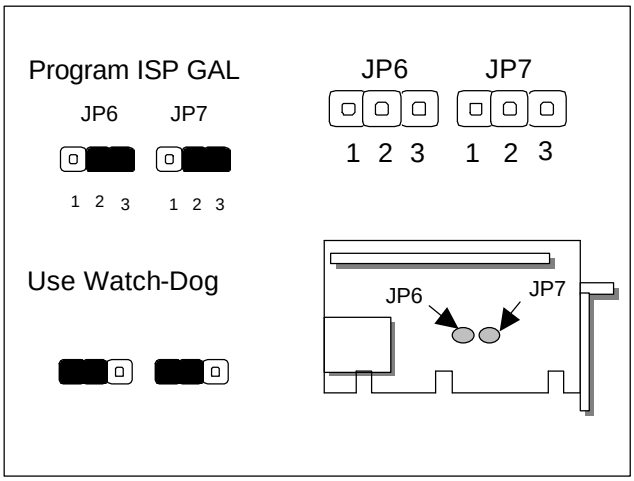



## ✦ P6 ~ JP7 : Select ISP GAL Function

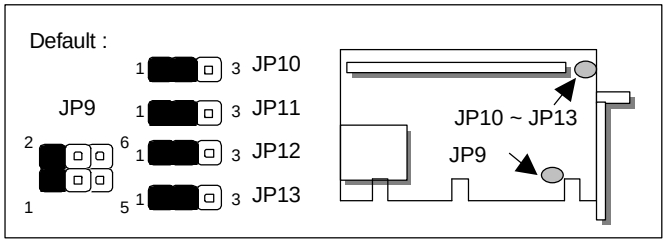
| ISP GAL Function | JP6 | JP7 |
|---|---|---|
| Program ISP GAL | 2-3 | 2-3 |
| Use Watch-Dog ( Default ) | 1-2 | 1-2 |

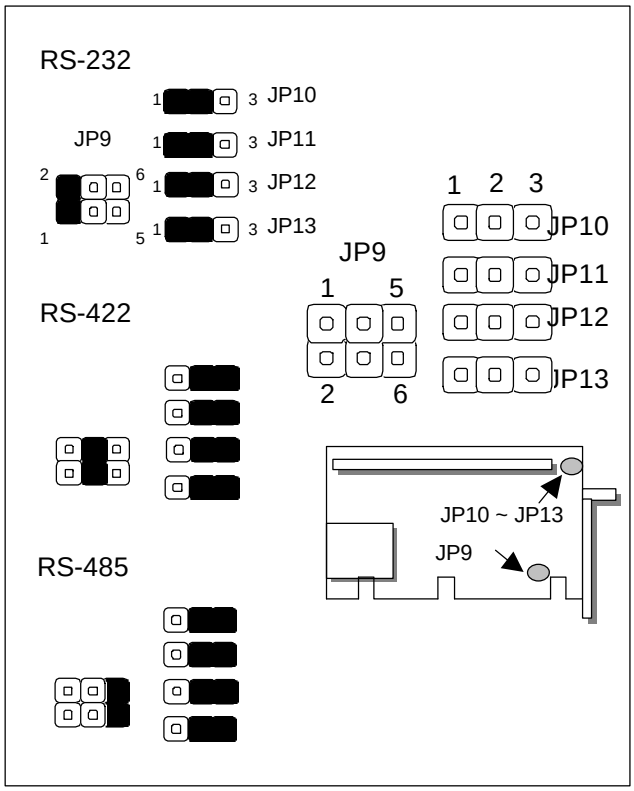


## ✦ JP9 ~ JP13 : Select COM2 Type

| COM2 Type | JP9 | JP10 | JP11 | JP12 | JP13 |
|---|---|---|---|---|---|
| RS-232 ( Default ) | 1-2 | 1-2 | 1-2 | 1-2 | 1-2 |
| RS-422 | 3-4 | 2-3 | 2-3 | 2-3 | 2-3 |
| RS-485 | 5-6 | 2-3 | 2-3 | 2-3 | 2-3 |



### ✦ J3 : Select Panel Type

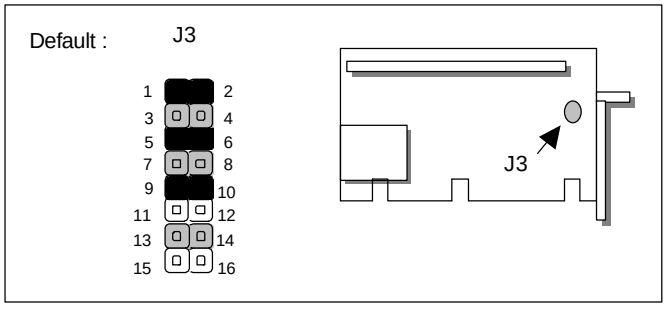
| Panel Type | J3 | |
|---|---|---|
| TFT ( Default ) | 1-2 | ON |
| STN | 1-2 | OFF |

| | | |
|---|---|---|
| XCLK ( Default ) | 3-4 | ON |
| XCLKN | 3-4 | OFF |

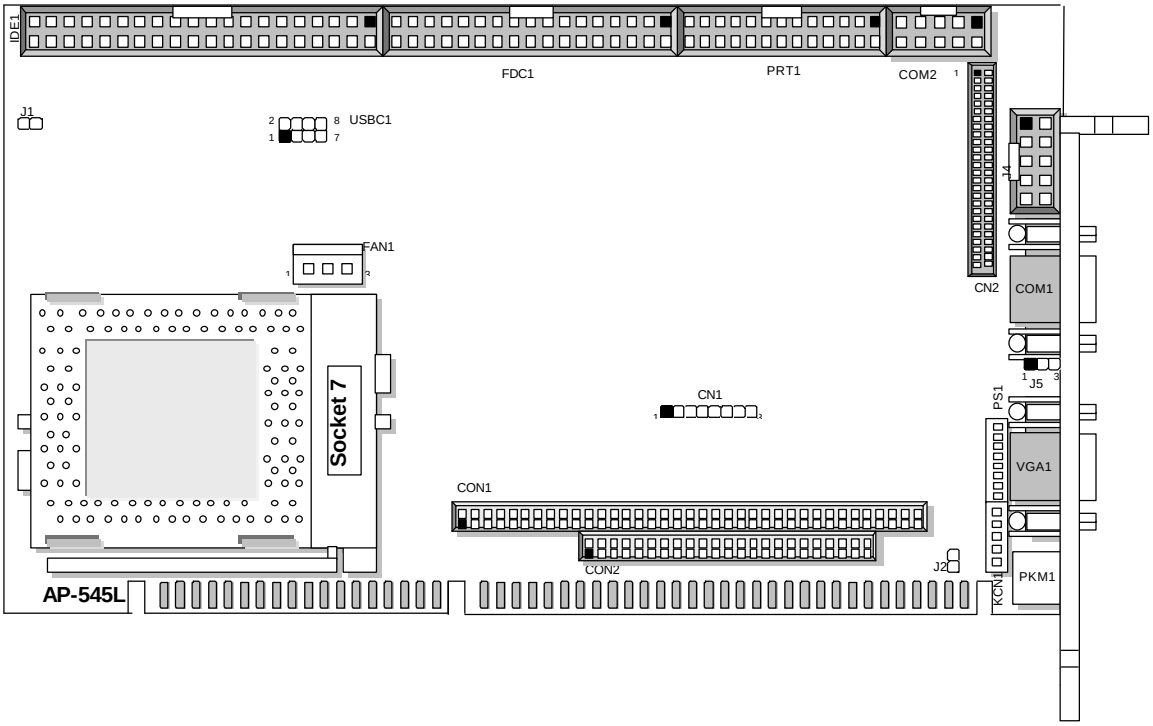
| | | |
|---|---|---|
| 640 x 480 ( Default ) | 5-6 , 7-8 | ON , ON |
| 800 x 600 | 5-6 , 7-8 | OFF , ON |
| 1K x 768 | 5-6 , 7-8 | ON , OFF |
| 1280 x 1K | 5-6 , 7-8 | OFF , OFF |

| | | |
|---|---|---|
| 9 BIT TFT | 9-10 , 11-12 , 13-14 | ON , ON , ON |
| 12 BIT TFT | 9-10 , 11-12 , 13-14 | OFF , ON , ON |
| 18 BIT TFT ( Default ) | 9-10 , 11-12 , 13-14 | ON , OFF , ON |
| 24 BIT TFT | 9-10 , 11-12 , 13-14 | OFF , OFF , ON |
| 12 x 2 BIT TFT | 9-10 , 11-12 , 13-14 | ON , ON , OFF |
| ANALOG TFT | 9-10 , 11-12 , 13-14 | OFF , ON , OFF |
| 18 x 2 BIT TFT | 9-10 , 11-12 , 13-14 | ON , OFF , OFF |

| | | |
|---|---|---|
| 16 BIT STN | 15-16 | ON |
| 24 BIT STN ( Default ) | 15-16 | OFF |



# 2.7 I/O CONNECTOR LOCATION FOR AP-545L



## 2.8 I/O CONNECTOR SUMMARY FOR AP-545L

| CONNECTOR | FUNCTION |
|---|---|
| J1 | IDE Active LED Connector |
| J2 | Reset Connector |
| J5 | Power LED Connector |
| FAN1 | CPU FAN Connector |
| USBC1 | USB Port #1 & #2 Connector |
| KCN1 | 5 Pin Keyboard Cable Connector (Header) |
| COM1 | RS-232 Serial Part #1 Connector (D-Sub) |
| COM2 | RS-232 Serial Part #2 Connector (Header) |
| PS1 | External Power Connector |
| VGA1 | VGA Monitor Connector (D-Sub) |
| J4 | VGA Connector (Header) |
| PKM1 | PS/2 Keyboard & Mouse Connector (Mini-Din) |
| CN1 | Program ISP GAL Connector |
| CN2 | LCD Panel Connector (Header) |
| IDE1 | Primary IDE Interface Connector (Header) |
| FDC1 | Floppy Interface Connector (Header) |
| PRT1 | Parallel Interface Connector (Header) |
| CON1、CON2 | PC/104 Connector |

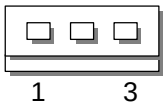
## 2.9 SYSTEM STATUS INDICATE AND CONTROL CONNECTORS

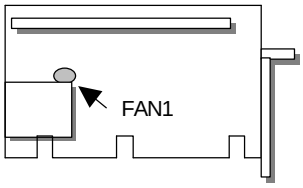
| CONNECTOR | PIN NO. | DESCRIPTION |
|---|---|---|
| J1 : IDE Active LED Connector | 1 | VCC |
| | 2 | IDE Active Signal |
| J2 : Reset Connector | 1 | Reset Input Signal |
| | 2 | Ground |
| J5 : Power LED Connector | 1 | Power LED VCC |
| | 2 | Ground |
| | 3 | Ground |

## 2.10 I/O CONNECTORS DESCRIPTION

✦ **FAN1 : FAN Connector**

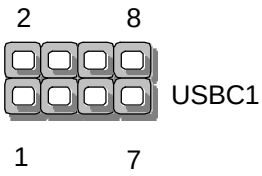
| PIN NO. | DESCRIPTION |
|---|---|
| 1 | Ground |
| 2 | +12V |
| 3 | NC |

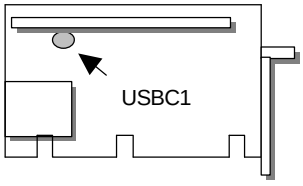



✦ **USBC1 : USB Port #1 & #2 Connector**

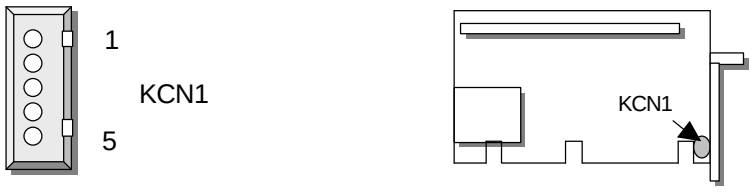
| PIN NO. | DESCRIPTION |
|---|---|
| 1 | USB VCC |
| 2 | USB P0- |
| 3 | USB P0+ |
| 4 | Ground |
| 5 | USB VCC |
| 6 | USB P1- |
| 7 | USB P1+ |
| 8 | Ground |



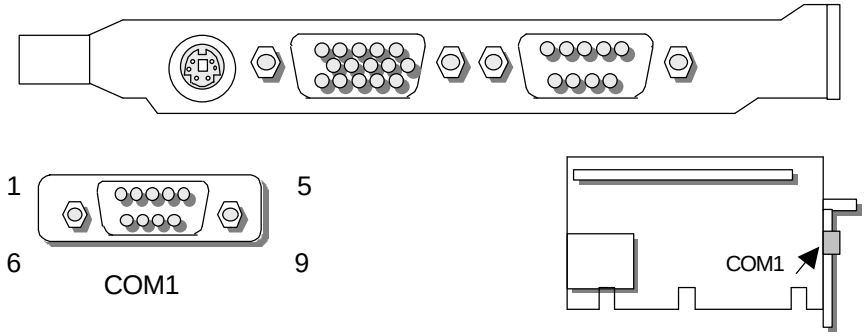
### ✦ KCN1 : 5 PIN Keyboard Cable Connector ( Header )

| PIN NO. | DESCRIPTION |
|---|---|
| 1 | Keyboard Clock |
| 2 | Keyboard Data |
| 3 | Ext. Power Good |
| 4 | Ground |
| 5 | +5V |



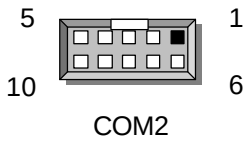

### ✦ COM1 : RS-232 Serial Port #1 Connector ( D-Sub )

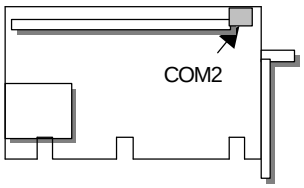
| PIN NO. | DESCRIPTION |
|---|---|
| 1 | Data Carrier Detect ( DCDA # ) |
| 2 | Receive Data ( RXDA ) |
| 3 | Transmit Data ( TXDA ) |
| 4 | Data Terminal Ready ( DTRA # ) |
| 5 | Ground ( GND ) |
| 6 | Data Set Ready ( DSRA # ) |
| 7 | Request To Send ( RTSA # ) |
| 8 | Clear To Send ( CTSA # ) |
| 9 | Ring Indicator ( RIA # ) |



### ✦ COM2 : RS-232 Serial Port #2 Connector ( Header )

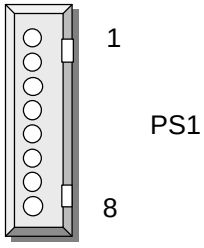
| PIN NO. | DESCRIPTION | | |
|---|---|---|---|
| | RS-232 | RS-422 | RS-485 |
| 1 | DCDB # | TX- | DATA- |
| 2 | RXDB | TX+ | DATA+ |
| 3 | TXDB | RX+ | NC |
| 4 | DTRB # | RX- | NC |
| 5 | Ground | Ground | Ground |
| 6 | DSRB # | NC | NC |
| 7 | RTSB # | NC | NC |
| 8 | CTSB # | NC | NC |
| 9 | RIB # | NC | NC |
| 10 | NC | NC | NC |

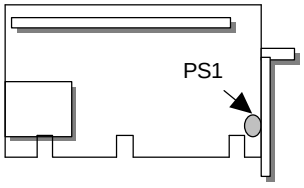



### ✦ PS1 : External Power Connector ( Header )

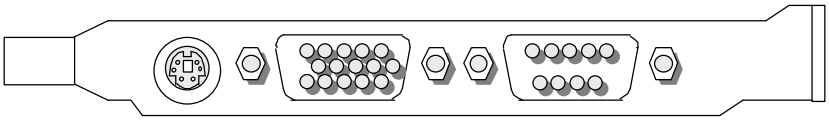
| PIN NO. | DESCRIPTION |
|---|---|
| 1 | +5V |
| 2 | +12V |
| 3 | -12V |
| 4 | Ground |
| 5 | Ground |
| 6 | -5V |
| 7 | +12V |
| 8 | +5V |

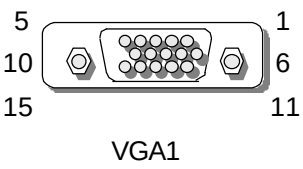


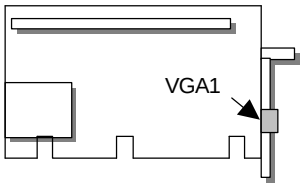
### ✦ VGA1 : VGA Monitor Connector

| PIN NO. | DESCRIPTION |
|---|---|
| 1 | Red Color Signal |
| 2 | Green Color Signal |
| 3 | Blue Color Signal |
| 4 | NC |
| 5 | Ground |
| 6 | Ground |
| 7 | Ground |
| 8 | Ground |
| 9 | NC |
| 10 | Ground |
| 11 | NC |
| 12 | NC |
| 13 | H-Sync. |
| 14 | V-Sync. |
| 15 | NC |



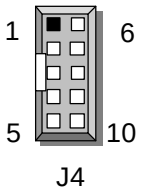


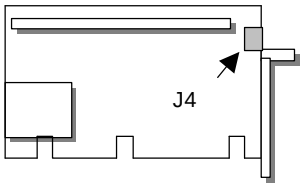
VGA1



### ✦ J4 : VGA Connector ( Header )

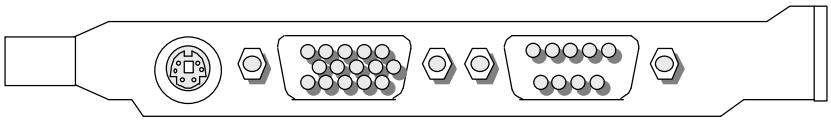
| PIN NO. | DESCRIPTION |
|---|---|
| 1 | Red Color Signal |
| 2 | Green Color Signal |
| 3 | Blue Color Signal |
| 4 | H-Sync. |
| 5 | V-Sync. |
| 6 | Ground |
| 7 | Ground |
| 8 | Ground |
| 9 | Ground |
| 10 | Ground |

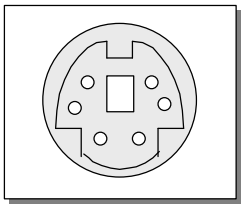


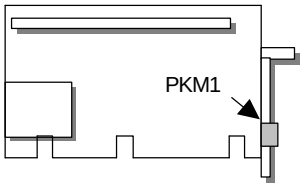
### ✦ PKM1 : PS/2 Keyboard & Mouse Connector ( Mini Din )

| PIN NO. | DESCRIPTION |
|---|---|
| 1 | PS/2 Keyboard Data |
| 2 | PS/2 Mouse Data |
| 3 | Ground |
| 4 | VCC |
| 5 | PS/2 Keyboard Clock |
| 6 | PS/2 Keyboard Clock |





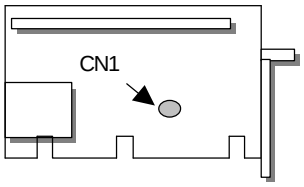
PKM1




### ✦ CN1 : Program ISP GAL Connector

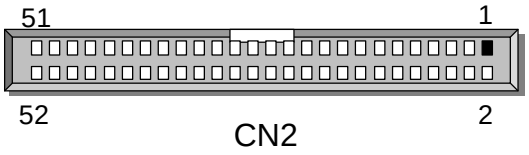
| PIN NO. | DESCRIPTION |
|---|---|
| 1 | VCC |
| 2 | SDO |
| 3 | SDI |
| 4 | ISP |
| 5 | NC |
| 6 | MODE |
| 7 | Ground |
| 8 | SCLK |

CN1

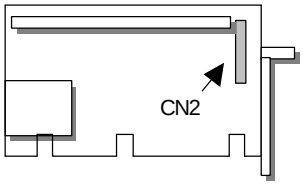


### ✦ CN2 : LCD Panel Connector ( Header )

| PIN NO. | SIGNAL | PIN NO. | SIGNAL |
|---|---|---|---|
| 1 | FDATA 0 | 2 | FDATA 1 |
| 3 | FDATA 2 | 4 | FDATA 24 |
| 5 | FDATA 3 | 6 | FDATA 4 |
| 7 | FDATA 25 | 8 | Ground |
| 9 | FDATA 5 | 10 | FDATA 6 |
| 11 | FDATA 26 | 12 | FDATA 7 |
| 13 | FDATA 8 | 14 | Ground |
| 15 | FDATA 27 | 16 | FDATA 9 |
| 17 | FDATA 10 | 18 | FDATA 28 |
| 19 | FDATA 11 | 20 | Ground |
| 21 | FDATA 12 | 22 | FDATA 29 |
| 23 | FDATA 13 | 24 | FDATA 30 |
| 25 | FDATA 14 | 26 | VBIASEN |
| 27 | FDATA 15 | 28 | FDATA 31 |
| 29 | FDATA 16 | 30 | FDATA 17 |
| 31 | FDATA 18 | 32 | FDATA 32 |
| 33 | Ground | 34 | FPSCLK |
| 35 | Ground | 36 | DDE |
| 37 | FP | 38 | LP |
| 39 | Ground | 40 | FDATA 19 |
| 41 | FDATA 20 | 42 | Ground |
| 43 | FDATA 21 | 44 | FDATA 22 |
| 45 | FDATA 33 | 46 | FDATA 23 |
| 47 | FDATA 34 | 48 | FPPEN |
| 49 | FDATA 35 | 50 | FPVDDEN |
| 51 | FPVCC | 52 | FPVCC |

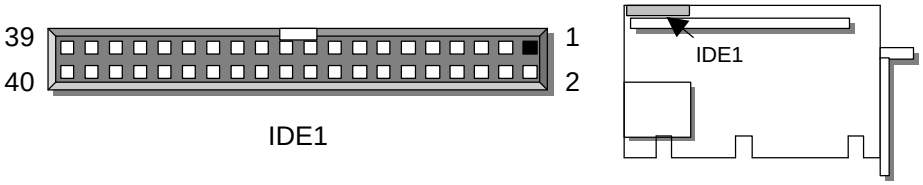


CN2



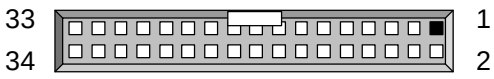
### ✦ IDE1 : Primary IDE Interface Connector ( Header )

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---|---|---|---|
| 1 | Reset # | 2 | Ground |
| 3 | Data 7 | 4 | Data 8 |
| 5 | Data 6 | 6 | Data 9 |
| 7 | Data 5 | 8 | Data 10 |
| 9 | Data 4 | 10 | Data 11 |
| 11 | Data 3 | 12 | Data 12 |
| 13 | Data 2 | 14 | Data 13 |
| 15 | Data 1 | 16 | Data 14 |
| 17 | Data 0 | 18 | Data 15 |
| 19 | Ground | 20 | NC |
| 21 | DMA REQ# | 22 | Ground |
| 23 | IOW# | 24 | Ground |
| 25 | IOR# | 26 | Ground |
| 27 | IOCHRDY | 28 | Ground |
| 29 | DMA ACK# | 30 | Ground |
| 31 | IRQ# | 32 | Ground |
| 33 | SA1 | 34 | NC |
| 35 | SA0 | 36 | SA2 |
| 37 | HDC CS0# | 38 | HDC CS1# |
| 39 | HDD Active | 40 | Ground |

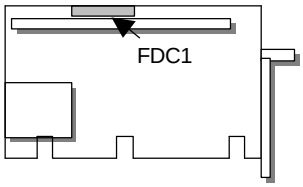


✦ **FDC1 : Floppy Interface Connector ( Header )**

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---|---|---|---|
| 1 | Ground | 2 | Density Select |
| 3 | Ground | 4 | NC |
| 5 | Ground | 6 | NC |
| 7 | Ground | 8 | Index # |
| 9 | Ground | 10 | Motor Enable A# |
| 11 | Ground | 12 | Drive Select B# |
| 13 | Ground | 14 | Drive Select A# |
| 15 | Ground | 16 | Motor Enable B# |
| 17 | Ground | 18 | Direction # |
| 19 | Ground | 20 | Step # |
| 21 | Ground | 22 | Write Data # |
| 23 | Ground | 24 | Write Gate # |
| 25 | Ground | 26 | Track 0# |
| 27 | Ground | 28 | Write Protect # |
| 29 | NC | 30 | Read Data # |
| 31 | Ground | 32 | Head Side Select # |
| 33 | NC | 34 | Disk Change # |

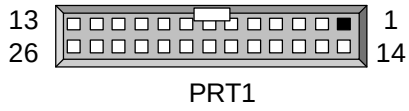


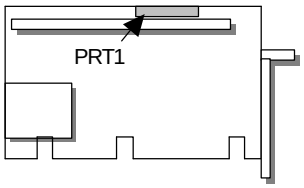

FDC1



### ✦ PRT1 : Parallel Interface Connector ( Header )

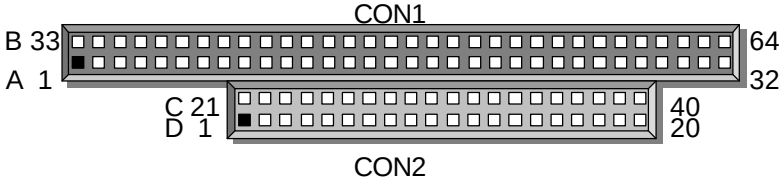
| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---|---|---|---|
| 1 | Strobe # | 14 | Ground |
| 2 | Auto Form Feed # | 15 | Data 6 |
| 3 | Data 0 | 16 | Ground |
| 4 | Error # | 17 | Data 7 |
| 5 | Data 1 | 18 | Ground |
| 6 | Initialize # | 19 | Acknowledge # |
| 7 | Data 2 | 20 | Ground |
| 8 | Printer Select IN # | 21 | Busy |
| 9 | Data 3 | 22 | Ground |
| 10 | Ground | 23 | Paper Empty |
| 11 | Data 4 | 24 | Ground |
| 12 | Ground | 25 | Printer Select |
| 13 | Data 5 | 26 | NC |

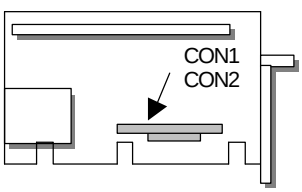


## ✦ CON1 , CON2 : PC/104 Connector

| PIN NO. | DESCRIPTION | | | |
|---|---|---|---|---|
| | CON1 | | CON2 | |
| | Row A | Row B | Row C | Row D |
| 1 | IOCHCK# | Ground | Ground | Ground |
| 2 | SD7 | RSTDRV | SBHE# | MEMCS16# |
| 3 | SD6 | +5V | LA23 | IOCS16# |
| 4 | SD5 | IRQ9 | LA22 | IRQ10 |
| 5 | SD4 | -5V | LA21 | IRQ11 |
| 6 | SD3 | DRQ2 | LA20 | IRQ12 |
| 7 | SD2 | -12V | LA19 | IRQ15 |
| 8 | SD1 | 0 WS# | LA18 | IRQ14 |
| 9 | SD0 | +12V | LA17 | DACK0# |
| 10 | IOCHRDY | NC | MEMR# | DRQ0 |
| 11 | AEN | SMEMW# | MEMW# | DACK5# |
| 12 | SA19 | SMEMR# | SD8 | DRQ5 |
| 13 | SA18 | IOW# | SD9 | DACK6# |
| 14 | SA17 | IOR# | SD10 | DRQ6 |
| 15 | SA16 | DACK3# | SD11 | DACK7# |
| 16 | SA15 | DRQ3 | SD12 | DRQ7 |
| 17 | SA14 | DACK1# | SD13 | +5V |
| 18 | SA13 | DRQ1 | SD14 | MASTER# |
| 19 | SA12 | REFRESH# | SD15 | Ground |
| 20 | SA11 | SYSCLK | NC | Ground |
| 21 | SA10 | IRQ7 | --- | --- |
| 22 | SA9 | IRQ6 | --- | --- |
| 23 | SA8 | IRQ5 | --- | --- |
| 24 | SA7 | IRQ4 | --- | --- |
| 25 | SA6 | IRQ3 | --- | --- |
| 26 | SA5 | DACK2# | --- | --- |
| 27 | SA4 | TC | --- | --- |
| 28 | SA3 | BALE | --- | --- |
| 29 | SA2 | +5V | --- | --- |
| 30 | SA1 | OSC | --- | --- |
| 31 | SA0 | Ground | --- | --- |
| 32 | Ground | Ground | --- | --- |



# CHAPTER 3.

## AMI BIOS SETUP

The AMI‘ s ROM BIOS provides a built-in Setup program that allows user to modify the basic system configuration and settings. The modified data will be stored in a battery-backed CMOS RAM so that these data will be retained even when the power is turned off. In general, the information saved in the CMOS RAM stay unchanged unless there is configuration change in the system, such as hard drive replacement or new equipment is installed. AMI is a registered trademark of the American Megatrends, Inc.

## 3.1 RUNNING AMI BIOS

The Setup Utility is stored in the BIOS ROM. When the power of the computer system is turned on, a screen message appears to give you an opportunity to call up the Setup Utility; while the BIOS will enter the Power On Self Test (POST) routines. The POST routines perform various diagnostic checks while initializing the board hardware. If the routines encounter an error during the tests, the error will be reported in either of the two different ways, hear a series of short beeps or see an error message on the screen display. There are two kinds of error: fatal or non-fatal. The system can usually continue to boot up sequence with the non-fatal errors. Non-fatal error messages usually appear on the screen along with the following instructions:

“ Press <F1> to RESUME ”

Write down the message and press the F1 key to continue the bootup sequence. After the POST routines are completed, the following message appears:

“ Press DEL to enter SETUP ”

**Entering Setup**

Turn on the power of the computer system and press <Del> immediately. If you don’ t have the chance to respond, reset the system by simultaneously typing the <Ctrl>, <Alt> and <Delete> keys, or by pushing the ‘ Reset ’ button on the system cabinet. You can also restart by turning the system OFF then ON.

## 3.2 AMI BIOS HIFLEX SETUP UTILITY

To access the AMI BIOS HIFLEX SETUP UTILITY program, press the <DEL> key. The screen display will appears as:

### Main Program Screen

| AMI BIOS HIFLEX SETUP UTILITY – VERSION 1.20<br>©1998 American Megatrends, Inc. All Rights Reserved |
|---|
| **Standard CMOS Setup**<br>Advanced CMOS Setup<br>Advanced Chipset Setup<br>Power Management Setup<br>PCI / Plug and Play Setup<br>Peripheral Setup<br>Auto-Detect Hard Disks<br>Change User Password<br>Change Supervisor Password<br>Change Language Setting<br>Auto Configuration with Optimal Settings<br>Auto Configuration with Fail Safe Settings<br>Save Settings and Exit<br>Exit Without Saving |
| Standard CMOS setup for changing time, date, hard disk type, etc.<br>ESC : Exit 🖼♬ : Sel F2/F3 : Color F10 : Save & Exit |

This screen provides access to the utility‘ s various functions.

Listed below are the explanation of the keys displayed at the bottom of the screen:

**<ESC>** **:** Exit the utility.

**ARROW KEYS** **:** Use arrow keys 🌡 🚤 to move cursor to your desired selection.

**<F10>** **:** Saves all changes made to Setup and exits program.

**<F2> / <F3>** **:** Changes background and foreground colors.

## 3.3 STANDARD CMOS SETUP

When you select the "STANDARD CMOS SETUP" on the main program, the screen display will appears as:

### Standard CMOS Setup Screen

```
                AMI BIOS SETUP – STANDARD CMOS SETUP
              ©1998 American Megatrends, Inc.   All Rights Reserved
Date (mm/dd/yyyy)   : Mon Dec 21, 1998                  Base Memory    : 640 KB
Time (hh/mm/ss)     : 09 : 29 : 11                      Extd Memory    : 127 MB

Floppy Drive A :    1.44 MB   3 1/2
Floppy Drive B :    Not Installed
                                                        LBA   Blk   PIO   32 Bit
          Type          Size  Cyln  Head  WPcom  Sec   Mode  Mode  Mode  Mode
Pri Master  : Auto                                                        Off
Pri Slave   : Auto                                                        Off

Boot Sector Virus Protection      Disable
Month  :  Jan   - Dec                                   ESC:Exit    ♫ : Sel
  Day  :   01   - 31                                    PgUp/PgDn: Modify
 Year  : 1901   - 2099                                  F2/F3:Color
```

Standard CMOS Setup options are displayed by choosing the Standard field from the AMIBIOS HIFLEX SETUP menu. All Standard Setup options are described below.

**Date/Time :** Select the Date/Time option to change the date or time. The current date and time are displayed. Enter new values through the displayed window. The time format is based on the 24-hour military-time clock. For example, 1 p.m. is 13:00:00. Press the ♫ or ♫ arrow key to move to the desired field. Press the PgUp or PgDn key to increment the setting, or type the desired value into the field.

**Floppy Drive A, B :** Choose the Floppy Drive A or B field to specify the floppy drive type. The settings are 360 KB $5^1/_4$", 1.2 MB $5^1/_4$", 720 KB $3^1/_2$", 1.44 MB $3^1/_2$", or 2.88 MB $3^1/_2$".

**Pri Master, Pri Slave :** Choose these fields to configure the hard disk drive named in each option. When you click on the option, the following parameters are listed as: Type, LBA/Large Mode, Block Mode, 32Bit Mode, and PIO Mode. All parameters are

related to IDE drives except **Type**.

**Configuring an MFM Drive :** If configuring an old MFM hard disk drive, you must know the drive parameters (number of heads, number of cylinders, number of sectors, the starting write precompensation cylinder, and drive capacity). Choose **Type** and the appropriate hard disk drive type (1-46). The old MFM hard drive types are listed on pages 26~27. If the drive parameters of the MFM drive do not match any drive type listed on pages 26~27, select *User* in the **Type** field and enter the drive parameters on the screen that appears.

**User-Defined Drive :** If you are configuring a SCSI drive or an MFM, RLL, ARLL, or ESDI drive with the drive parameters that do not match drive types 1-46, you can select the *User* in the **Type** field. You must then enter the drive parameters on the screen that appears. The drive parameters include:

- Cylinder (number of cylinders),
- Head (number of heads)
- WPcom (starting write precompensation cylinder),
- Sec (number of sectors)
- Size (drive capacity)

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

**Configuring IDE Drives :** If the hard disk drive to be configured is an IDE drive, select the appropriate drive icon (Pri Master, Pri Slave). Select the IDE Detect icon to automatically detect all drive parameters.

AMIBIOS automatically detects the IDE drive parameters (including ATAPI CD ROM drives) and displays them. Click on the OK button to accept these parameters or you can set the parameters manually if you are absolutely certain that you know the correct IDE drive parameters.

Click on **LBA/Large Mode** and choose *On* to enable support for IDE drives with capacities greater than 528 MB.

Click on **Block Mode** and choose *On* to support IDE drives that use Block Mode.

Click on **32Bit Mode** and click on *On* to support for IDE drive that permit 32-bit accesses.

Click on **PIO Mode** to select the IDE Programmed I/O mode. PIO programming also works with ATAPI CD-ROM drives. The settings are *Auto, 0, 1, 2, 3, 4,* or *5*. Click on *Auto* to allow AMIBIOS to automatically find the PIO mode that the IDE drive being configured uses. If you select *0-5* you must make absolutely certain that you are selecting the PIO mode supported by the IDE drive being configured

**Configuring a CD-ROM Drive :** Select the appropriate drive icon (Pri Master, Pri Slave). Choose the **Type** parameter and select CDROM. You can boot the computer from a CD-ROM drive. You can also choose *Auto* and let AMIBIOS automatically set the correct drive parameters.

**Hard Disk Drive Types**

| Type | Cylinders | Heads | Write Pre-Compensation | Landing Zone | Sectors | Capacity |
|---|---|---|---|---|---|---|
| 1 | 306 | 4 | 128 | 305 | 17 | 10 MB |
| 2 | 615 | 4 | 300 | 615 | 17 | 20 MB |
| 3 | 615 | 6 | 300 | 615 | 17 | 31 MB |
| 4 | 940 | 8 | 512 | 940 | 17 | 62 MB |
| 5 | 940 | 6 | 512 | 940 | 17 | 47 MB |
| 6 | 615 | 4 | 65535 | 615 | 17 | 20 MB |
| 7 | 462 | 8 | 36 | 511 | 17 | 31 MB |
| 8 | 733 | 5 | 65535 | 733 | 17 | 30 MB |
| 9 | 900 | 15 | 65535 | 901 | 17 | 112 MB |
| 10 | 820 | 3 | 65535 | 820 | 17 | 20 MB |
| 11 | 855 | 5 | 65535 | 855 | 17 | 35 MB |
| 12 | 855 | 7 | 65535 | 855 | 17 | 50 MB |
| 13 | 306 | 8 | 128 | 319 | 17 | 20 MB |
| 14 | 733 | 7 | 65535 | 733 | 17 | 43 MB |
| 16 | 612 | 4 | 0 | 663 | 17 | 20- MB |
| 17 | 977 | 5 | 300 | 977 | 17 | 41 MB |
| 18 | 977 | 7 | 65535 | 977 | 17 | 57 MB |
| 19 | 1024 | 7 | 512 | 1023 | 17 | 60 MB |
| 20 | 733 | 5 | 300 | 732 | 17 | 30 MB |
| 21 | 733 | 7 | 300 | 732 | 17 | 43 MB |
| 22 | 733 | 5 | 300 | 733 | 17 | 30 MB |
| 23 | 306 | 4 | 0 | 336 | 17 | 10 MB |
| 24 | 925 | 7 | 0 | 925 | 17 | 54 MB |
| 25 | 925 | 9 | 65535 | 925 | 17 | 69 MB |
| 26 | 754 | 7 | 754 | 754 | 17 | 44 MB |
| 27 | 754 | 11 | 65535 | 754 | 17 | 69 MB |
| 28 | 699 | 7 | 256 | 699 | 17 | 41 MB |
| 29 | 823 | 10 | 65535 | 823 | 17 | 68 MB |
| 30 | 918 | 7 | 918 | 918 | 17 | 53 MB |
| 31 | 1024 | 11 | 65535 | 1024 | 17 | 94 MB |
| 32 | 1024 | 15 | 65535 | 1024 | 17 | 128 MB |
| 33 | 1024 | 5 | 1024 | 1024 | 17 | 43 MB |
| 34 | 612 | 2 | 128 | 612 | 17 | 10 MB |
| 35 | 1024 | 9 | 65535 | 1024 | 17 | 77MB |
| 36 | 1024 | 8 | 512 | 1024 | 17 | 68 MB |
| 37 | 615 | 8 | 128 | 615 | 17 | 41 MB |
| 38 | 987 | 3 | 987 | 987 | 17 | 25 MB |
| 39 | 987 | 7 | 987 | 987 | 17 | 57 MB |
| 40 | 820 | 6 | 830 | 820 | 17 | 41 MB |
| 41 | 977 | 5 | 977 | 977 | 17 | 41 MB |
| 42 | 981 | 5 | 981 | 981 | 17 | 41 MB |
| 43 | 830 | 7 | 512 | 830 | 17 | 48 MB |
| 44 | 830 | 10 | 65535 | 830 | 17 | 69 MB |
| 45 | 917 | 15 | 65535 | 918 | 17 | 114 MB |
| 46 | 1224 | 15 | 65535 | 1223 | 17 | 152 MB |
| | USER-DEFINED HARD DRIVE Enter user-supplied parameters | | | | | |

## 3.4 ADVANCED CMOS SETUP

When you select the "ADVANCED CMOS SETUP" on the main program, the screen display will appears as:

### Advanced CMOS Setup Screen

| AMIBIOS SETUP – ADVANCED CMOS SETUP<br>0©1998 American Megatrends, Inc. All Rights Reserved | | |
|---|---|---|
| 1st Boot Device | FLOPPY | Available Options |
| 2nd Boot Device | IDE-0 | Disabled : |
| 3rd Boot Device | CDROM | IDE-0 |
| 4th Boot Device | SCSI | IDE-1 |
| Boot From Card BIOS | Yes | IDE-2 |
| Try Other Boot Devices | Yes | IDE-3 |
| S.M.A.R.T. for Hard Disks | Enabled | ▸ Floppy |
| Quick Boot | Enabled | ARMD-FDD |
| BootUp Num-Lock | On | ARMD-HDD |
| Floppy Drive Seek | Disabled | CDROM |
| HDD Access Control | Normal | SCSI |
| PS/2 Mouse Support | Enabled | NETWORK |
| System Keyboard | Present | |
| Primary Display | VGA/EGA | |
| Password Check | Setup | |
| Parity Check | Disabled | |
| Boot To OS/2, DRAM 64MB or Above | No | ESC : Exit 🖼♬ : Sel |
| Wait For ' F1' If Error | Enabled | PgUp/PgDn : Modify |
| Hit ' DEL ' Message Display | Enabled | F2/F3 : Color |

Note : The above page of the Advanced CMOS Setup only shows part of the related options. To proceed to the next options, please move your cursor downwards.

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

**Boot Device :** 1st ~ 4th Boot Devices are the options that set the sequence of boot drives (FLOPPY, IDE-0, CDROM, LS-120 or SCSI) that the AMIBIOS attempts to boot from after AMIBIOS POST completes. To select the devices, please refer to Available options.

**Available Options :** Choose your desired devices from the selection here – Disabled, IDE-0, IDE-1, IDE-2, IDE-3, FLOPPY, LS-120, CDROM and SCSI.

**Boot From Card BIOS :** This option is predefined by the system board designer. The default setting is *Yes*.

**Try Other Boot Devices :** This option is predefined by the system board designer. The default setting is *Yes*.

**S.M.A.R.T. for Hard Disks :** This option is predefined by the system board designer. The default setting is *Enabled*.

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

| Setting | Description |
|---|---|
| *Disabled* | AMIBIOS test all system memory. AMIBIOS waits up to 40 seconds for READY signal from the IDE hard disk drive. AMIBIOS waits for 0.5 seconds after sending a RESET signal to the IDE drive to allow the IDE drive time to get ready again. AMIBIOS checks for a <Del> key press and runs WINBIOS Setup if the key has been pressed. |
| *Enabled* | AMIBIOS does not test system memory above 1MB.<br><br>AMIBIOS does not wait up to 40 seconds for a READY signal from the IDE hard disk drive. If a READY signal is not received immediately from the IDE drive, AMIBIOS does not configure that drive. AMIBIOS does not wait for 0.5 seconds after sending a RESET signal to the IDE drive to allow the IDE drive time to get ready again.<br><br>You cannot run WINBIOS Setup at system boot, because there is no delay for the *Hit <DEL> to run Setup* message. |

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

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

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

To continue the ‘ Advanced CMOS Setup’ , please move your cursor downwards to seek for other options.

| AMI BIOS SETUP – ADVANCED CMOS SETUP<br>©1998 American Megatrends, Inc. All Rights Reserved | | |
|---|---|---|
| PS/2 Mouse Support | Enabled | Available Options : |
| Typematic Rate | Fast | ▸ Disabled |
| System Keyboard | Present | Enabled |
| Primary Display | VGA/EGA | Cached |
| Password Check | Setup | |
| Parity Check | Disabled | |
| Boot To OS/2, DRAM 64MB or Above | No | |
| Wait For ‘ F1’ If Error | Enabled | |
| Hit ‘ DEL ‘ Message Display | Enabled | |
| Internal Cache | WriteBack | |
| External Cache | WriteBack | |
| System BIOS Cacheable | Enabled | |
| C000, 16k Shadow | Disabled | |
| C400, 16k Shadow | Disabled | |
| C800, 16k Shadow | Disabled | |
| CC00, 16k Shadow | Disabled | |
| D000, 16k Shadow | Disabled | |
| D400, 16k Shadow | Disabled | ESC : Exit 🖼♬ : Sel |
| D800, 16k Shadow | Disabled | PgUp/PgDn : Modify |
| DC00, 16k Shadow | Disabled | F2/F3 : Color |

**Floppy Access Seek :** Predefined setting is *Disabled.*

**HDD Access Control :** Predefined setting is *Normal.*

**PS/2 Mouse Support :** When this option is set to *Enabled*, AMIBIOS supports a PS/2-type mouse. The settings are *Enabled* or *Disabled*. The default settings are *Disabled*. System Boot Up Sequence.

**Primary Display :** This option specifies the type of display monitor and adapter in the computer. The settings are *Mono*, *CGA40*, *CGA80*, *VGA/EGA*, or *Absent*. The Optimal and Fail-Safe default settings are *VGA/EGA*.

**Password Check :** This option enables password checking every time the computer is powered on or every time WINBIOS Setup is executed. If *Always* is chosen, a user password prompt appears every time the computer is turned on. If *Setup* is chosen, the password prompt appears if WINBIOS is executed. The Optimal and Power-On defaults are *Setup*.

**Parity Check :** Set this option to *Enabled* to check the parity of all system memory. The setting are *Disabled* or *Enabled*. The Optimal and Fail-Safe default settings are *Disabled*.

**Boot To OS/2, DRAM 64MB or Above :** Set this option to *Yes* to permit AMIBIOS to run with IBM OS/2. The settings are *Yes* or *No*. The default settings are *No*.

**Wait For ' F1' if Error :** AMIBIOS POST error messages are followed by :

Press <F1> to continue

If this option is set to *Disabled*, AMIBIOS does not wait for you to press the <F1> key after an error message. The settings are *Disabled* or *Enabled*. The Optimal and Fail-Safe default settings are *Enabled*.

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

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

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

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

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

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

**C000,16K Shadow** **D000,16K Shadow**
**C400,16K Shadow** **D400,16K Shadow**
**C800,16K Shadow** **D800,16K Shadow**
**CC00,16K Shadow** **C000,16K Shadow**

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

| Setting | Description |
|---|---|
| *Shadow* | The contents of C0000h - C3FFFh are written to the same address in system memory (RAM) for faster execution. |
| *Cache* | The contents of the named ROM area are written to the same address in system memory (RAM) for faster execution, if an adaptor ROM will be using the named ROM area. Also, the contents of the RAM area can be read from and written to cache memory. |
| *Disabled* | The video ROM is not copied to RAM. The contents of the video ROM cannot be read from or written to cache memory. |

The default setting is Cache.

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

## 3.5 ADVANCED CHIPSET SETUP

When you select the " ADVANCED CHIPSET SETUP" on the main program, the screen display will appears as:

### Advanced Chipset Setup Screen

| AMI BIOS SETUP – ADVANCED CHIPSET SETUP<br>©1998 American Megatrends, Inc. All Rights Reserved | | |
|---|---|---|
| DRAM Automatic Configuration | Enabled | Available Options |
| SDRAM Access Time | 10 ns | Disabled |
| EDO Dram Access Time | None Used | ▸ Enabled |
| FP Dram Access Time | None Used | |
| Write Merge Enable | Disabled | |
| Refresh Cycle Time | 12 | |
| RAS Pulse Width When Refresh | 6T | |
| DRAM Read Leadoff Time | 1T | |
| RAMW# Assertion Timing | 3T | |
| CAS# Pulse Width for FP | 2T | |
| CAS Precharge Time for FPM | 2T-Burst 1T | |
| CAS# Pulse Width for EDO | 1T | |
| CAS Precharge Time for EDO | 2T-Burst 1T | |
| ISA Bus Clock Frequency | 7.159MHZ | |
| SDRAM Write Retire Rate | X-2-2-2 | |
| CAS Latency | 3T | |
| MDLE Delay | Delay 3 ns | |
| NA# Enable | Disabled | ESC : Exit 🖼♬ : Sel |
| Write NA# Disable | Enabled | PgUp/PgDn : Modify |
| Pipeline SRAM back to back timing | 1 Bank L2 | F2/F3 : Color |

In the ' Advanced Chipset Setup' page, all options are predefined by the system board designer. Any attempt to change the parameter of the fields are not recommended.

To continue this page, please move your cursor downwards to seek for other options.

| AMI BIOS SETUP – ADVANCED CHIPSET SETUP<br>©1997 American Megatrends, Inc. All Rights Reserved | | |
|---|---|---|
| RAMW# Assertion Timing | 3T | Available Options: |
| CAS# Pulse Width for FP | 2T | ▸ Disabled |
| CAS Precharge Time for FPM | 2T-Burst 1T | Enabled |
| CAS# Pulse Width for EDO | 1T | |
| CAS Precharge Time for EDO | 2T-Burst 1T | |
| ISA Bus Clock Frequency | 7.159MHZ | |
| SDRAM Write Retire Rate | X-2-2-2 | |
| CAS Latency | 3T | |
| MDLE Delay | Delay 3 ns | |
| NA# Enable | Disabled | |
| Write NA# Disable | Enabled | |
| Pipeline SRAM back to back timing | 1 Bank L2 | |
| Single Read Allocation | Disabled | |
| Read FIFO | Disabled | |
| PCI Enhanced Memory Write | Disabled | |
| CPU to PCI Post Write | 3T | |
| CPU to PCI Burst Write | Enabled | |
| MEMORY HOLE at 15M – 16M | Disabled | ESC : Exit 🖼♬ : Sel |
| USB Function | Disabled | PgUp/PgDn : Modify |
| USD Keyboard/Mouse Legacy Support | Disabled | F2/F3 : Color |

## 3.6 POWER MANAGEMENT SETUP

The "Power Management Setup" controls the CPU card' s "Green" features. When you select the "POWER MANAGEMENT SETUP" on the main program, the screen display will appears as:

### Power Management Setup Screen

| AMI BIOS SETUP – POWER MANAGEMENT SETUP<br>©1997 American Megatrends, Inc. All Rights Reserved | | |
|---|---|---|
| Power Management / APM | Disabled | Available Options |
| Instant On Support | Disabled | ▸ Disabled |
| Green PC Monitor Power State | Off | ▸ Disabled |
| Video Power Down Mode | Suspend | Enabled |
| Hard Disk Power Down Mode | Suspend | |
| Standby Time Out (Minute) | Disabled | |
| Suspend Time Out (Minute) | Disabled | |
| Slow Clock Ratio | 1 : 8 | |
| Ring Active | Disabled | |
| IRQ 3 (COM2/COM4) | Monitor | |
| IRQ 4 (COM1/COM3) | Monitor | |
| IRQ 5 (LPT2) | Ignore | |
| IRQ 7 (LPT1) | Ignore | |
| IRQ 9 | Ignore | |
| IRQ10 | Ignore | |
| IRQ11 | Ignore | |
| IRQ12 (PS2 Mouse) | Monitor | |
| IRQ13 (Math Coprocessor) | Ignore | ESC : Exit 🖼♬ : Sel |
| IRQ14 | Monitor | PgUp/PgDn : Modify |
| IRQ15 | Monitor | F2/F3 : Color |

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

**Power Management / APM :** Set this option to Enabled to enable the power management and APM (Advanced Power Management) features.
The settings are *Enabled* or *Disabled*. The default setting is *Disabled*.

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

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

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

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

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

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

**Slow Clock Ratio :** This option specifies the speed at which the system clock runs in power saving modes. The settings are expressed as a ratio between the normal clock speed and the power down clock speed. The settings are 1:1, 1:2 (half as fast as normal), 1:4 (the normal clock speed), 1:8, 1:16, 1:32, 1:64, or 1:128. The default setting is 1:1.

The following options stated below enable event monitoring. When the computer is in a power saving mode, activity on the named interrupt request line is monitored by AMIBIOS. When any activity occurs, the computer enters Full On mode. Each of these options can be set to *Monitor* or *Ignore*. The default setting for all options is *Ignore*.

- **IRQ3 (COM2/COM4)** **:** Monitor
- **IRQ4 (COM1/COM3)** **:** Monitor
- **IRQ5 (LPT2)** **:** Ignore
- **IRQ7 (LPT1)** **:** Ignore
- **IRQ9** **:** Ignore
- **IRQ10** **:** Ignore
- **IRQ11** **:** Ignore
- **IRQ12 (PS2 Mouse)** **:** Monitor
- **IRQ13 (Math Coprocessor)** **:** Ignore
- **IRQ14** **:** Monitor
- **IRQ15** **:** Monitor

## 3.7 PCI PLUG AND PLAY SETUP

Both the ISA and PCI buses on the CPU card use system IRQs & DMAs. You must set up the IRQ and DMA assignments correctly through the PCI / Plug and Play Setup utility, otherwise the SBC will not work properly.

When you select the "PCI / PLUG AND PLAY SETUP" on the main program, the screen display will appears as:

### PCI / Plug and Play Setup Screen

| AMI BIOS SETUP – PCI / PLUG AND PLAY SETUP<br>©1998 American Megatrends, Inc. All Rights Reserved | | |
|---|---|---|
| Plug and Play Aware O/S | No | Available Options |
| Clear NVRAM | No | ▸ No |
| PCI Latency Timer (PCI Clocks) | 64 | Yes |
| PCI VGA Palette Snoop | Disabled | |
| PCI IDE BusMaster | Disabled | |
| OffBoard PCI IDE Card | Auto | |
| OffBoard PCI IDE Primary IRQ | Disabled | |
| OffBoard PCI IDE Secondary IRQ | Disabled | |
| Assign IRQ to PCI VGA Card | Yes | |
| PCI Slot1 IRQ Priority | Auto | |
| PCI Slot2 IRQ Priority | Auto | |
| PCI Slot3 IRQ Priority | Auto | |
| PCI Slot4 IRQ Priority | Auto | |
| DMA Channel 0 | PnP | |
| DMA Channel 1 | PnP | |
| DMA Channel 3 | PnP | |
| DMA Channel 5 | PnP | |
| DMA Channel 6 | PnP | ESC : Exit 🖼♬ : Sel |
| DMA Channel 7 | PnP | PgUp/PgDn : Modify |
| IRQ3 | ISA/EISA | F2/F3 : Color |

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

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

Fail-Safe default settings are *No*.

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

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

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

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

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

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

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

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

| | | | |
|---|---|---|---|
| **IRQ 3** | **IRQ 7** | **IRQ 11** | **IRQ 14** |
| **IRQ 4** | **IRQ 9** | **IRQ 12** | **IRQ 15** |
| **IRQ 5** | **IRQ 10** | | |

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

**Assign IRQ to PCI VGA Card :** This setting specify the requirement of IRQ dedicated for PCI VGA Card. The default setting is *Yes*.

To continue the ' Advanced CMOS Setup' , please move your cursor downwards to seek for other options.

| AMI BIOS SETUP – PCI / PLUG AND PLAY SETUP<br>©1997 American Megatrends, Inc. All Rights Reserved | | |
|---|---|---|
| PCI Slot3 IRQ Priority | Auto | Available Options |
| PCI Slot4 IRQ Priority | Auto | ▸ Disabled |
| DMA Channel 0 | PnP | 16k |
| DMA Channel 1 | PnP | 32k |
| DMA Channel 3 | PnP | 64k |
| DMA Channel 5 | PnP | |
| DMA Channel 6 | PnP | |
| DMA Channel 7 | PnP | |
| IRQ3 | ISA/EISA | |
| IRQ4 | ISA/EISA | |
| IRQ5 | PCI/PnP | |
| IRQ7 | ISA/EISA | |
| IRQ9 | PCI/PnP | |
| IRQ10 | PCI/PnP | |
| IRQ11 | PCI/PnP | |
| IRQ12 | PCI/PnP | |
| IRQ14 | PCI/PnP | |
| IRQ15 | PCI/PnP | ESC : Exit 🖼♫ : Sel |
| Reserved Memory Size | Disabled | PgUp/PgDn : Modify |
| Reserved Memory Address | C8000 | F2/F3 : Color |

**PCI Slot1 / Slot2 / Slot3 / Slot4 IRQ Priority :** Without prior definition from the system board designer, the default settings of these fields are *Auto*. These options determine if AMIBIOS should remove an IRQ from the pool of available IRQs passed to BIOS configurable devices. The available IRQ pool is determined by reading the ESCD NVRAM. If more IRQs must be removed from the pool, the end user can use these PCI/PnP Setup options to remove the IRQ by assigning the option to the *ISA/EISA* setting. Onboard I/O is configurable by AMIBIOS. The IRQs used by onboard I/O are configured as *PCI/PnP*.

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

**DMA Channels :** This option can be used to reserve a DMA channel for use by legacy ISA adapter cards. The settings are *Disabled, DMA Ch0, DMA Ch1, DMA Ch 3, DMA Ch 5, DMA Ch 6,* or *DMA Ch 7*. The Optimal and Fail-Safe default settings are *PnP*.

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

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

## 3.8 PERIPHERAL SETUP

When you select the "PERIPHERAL SETUP" on the main program, the screen display will appears as:

### Peripheral Setup Screen

| AMI BIOS SETUP – PERIPHERAL SETUP<br>©1998 American Megatrends, Inc. All Rights Reserved | | |
|---|---|---|
| OnBoard FDC | Enabled | Available Options |
| Floppy Drive Swap | Disabled | Auto |
| OnBoard Serial PortA | 3F8h/COM1 | Disabled |
| OnBoard Serial PortB | 2F8h/COM2 | ▸ Enabled |
| IR I/O pin Location Select | SINB/SOUTB | |
| Serial PortB Mode | Normal | |
| IrDA Protocol | N/A | |
| IR Port Support | N/A | |
| IR Mode Select | N/A | |
| IR IRQ Select | Auto | |
| IR DMA Select | N/A | |
| OnBoard Parallel Port | 378h | |
| Parallel Port Mode | Normal | |
| EPP Version | N/A | |
| Parallel Port IRQ | 7 | |
| Parallel Port DMA Channel | N/A | |
| KB Wake-up function | Disabled | ESC : Exit ↑↓ : Sel |
| Mouse Wake-up function | Disabled | PgUp/PgDn : Modify |
| Onboard PCI IDE | Primary | F2/F3 : Color |

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

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

**Onboard Serial PortA :** This option enables serial port A on the motherboard and specifies the base I/O port address for serial port A. The settings are *3F8h, 3E8h*, or *Disabled*. The Optimal default setting is *3F8h*. The Fail-Safe default setting is *Disabled*.

**Onboard Serial PortB :** This option enables serial port B on the motherboard and specifies the base I/O port address for serial port B. The settings are *2F8h, 2E8h,* or

*Disabled*. The Optimal default setting is *2F8h*. The Fail-Safe default setting is *Disabled*.

**IR Port Support :** This option is predefined by the system board designer. The default setting is *Disabled*. All the related fields -- **IR Mode Select, IR Base Address Select, IR IRQ Select,** and **IR DMA Select** are factory settings.

**Onboard Parallel Port :** This option enables the parallel port on the motherboard and specifies the parallel port base I/O port address. The settings are 378h, 278h, or Disabled. The Optimal default setting is 378h. The Fail-Safe default setting is Disabled.

**Parallel Port Mode :** This option specifies the parallel port mode. ECP and EPP are both bidirectional data transfer schemes that adhere to the IEEE P1284 specifications. The default setting is *Normal*. The other settings are:

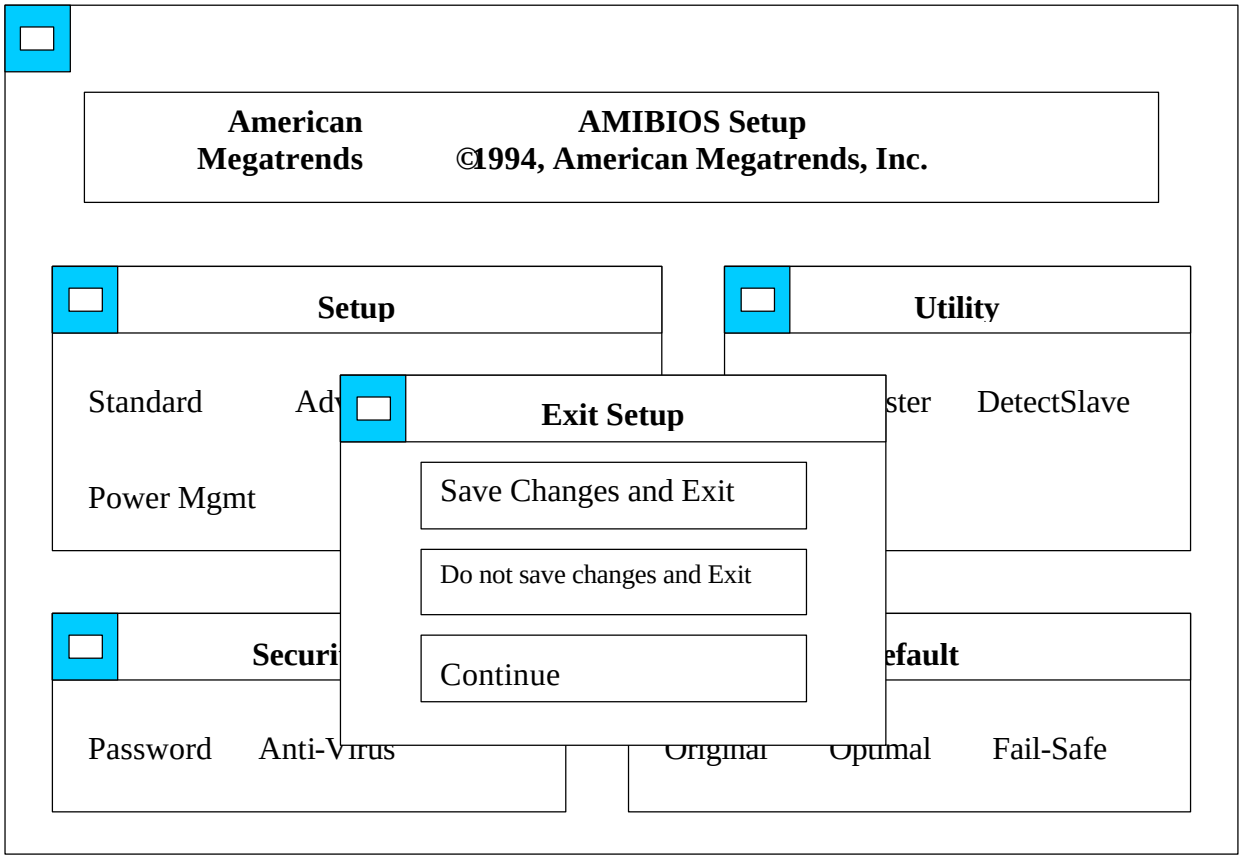
| Setting | Description |
|---|---|
| *Normal* | Normal The normal parallel port mode is used. This is the default setting. |
| *Cache* | Bi-Dir Use this setting to support bidirectional transfers on the parallel port. |
| *EPP* | The parallel port can be used with devices that adhere to the Enhanced Parallel Port (EPP) specification. EPP uses the existing parallel port signals to provide asymmetric bidirectional data transfer driven by the host device. |
| *ECP* | The parallel port can be used with devices that adhere to the Extended Capabilities Port (ECP) specification. ECP uses the DMA protocol to achieve transfer rates of approximately 2.5 Mbs. ECP provides symmetric bidirectional communications. |

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

## 3.9 CHANGE SUPERVISOR / USER PASSWORD

The "SECURITY" utility sets the password for *Supervisor* and *User*. The single board computer is shipped with the password disabled. When you select the "CHANGE SUPERVISOR Password" on the main program, the screen display will appears as:

**Change Supervisor Password**




**Security :** Three icons appear in this part of the WINBIOS Setup screen –

- Supervisor (Password)
- User (Password)
- Anti-Virus

**Two Levels of Passwords :** Both the Supervisor and the User icons configure password support. If you use both, the Supervisor password must be set first. The system can be configured so that all users must enter a password every time the system boots or when WINBIOS Setup is executed, using either or both the Supervisor password or User password.

**AMIBIOS Password Support :** The Supervisor and User icons activate two different levels of password security. If WINBIOS Setup has an optional password feature. The system can be configured so that all users must enter a password every time the system boots or when WINBIOS Setup is executed.

**Setting a Password :** The password check option is enabled in Advanced Setup (see page Error! Bookmark not defined. by choosing either *Always* (the password prompt appears every time the system is powered on) or *Setup* (the password prompt appears only when WINBIOS is run). The password is encrypted and stored in NVRAM.

As shown on the above screen, you are prompted for a 1 - 6 character password. You can either type the password on the keyboard or select each letter of the password, one at a time, using the mouse. The password does not appear on the screen when typed. Make sure you write it down. If you forget it, you must drain NVRAM and reconfigure.

**If You Do Not Want to Use a Password :** Press <Enter> when the password prompt appears.

**Changing a Password :** Select the *Supervisor* or *User* icon from the Security section of the WINBIOS Setup main menu. Enter the password and press <Enter>. The screen does not display the characters entered. After the new password is entered, retype the new password as prompted and press <Enter>.

If the password confirmation is incorrect, an error message appears. If the new password is entered without error, press <Esc>. The password is stored in NVRAM after WINBIOS completes. The next time the system boots, a password prompt appears if the password function is present and enabled.

**Remember the Password :** Keep a record of the new password when the password is changed. If you forget the password, you must erase the system configuration information in NVRAM (Non-Volatile Random Access Memory). See page Error! Bookmark not defined. for information about erasing system configuration information.
Note : If you forget your password, the only way to solve this problem is to discharge the CMOS memory by turning power off and placing a shunt on the S1 (open pad) for 5 seconds, then removing the shunt.
Under the Security window of the WINBIOS Setup screen, you can also select the Anti-Virus Icon.

**Anti-Virus :** When this icon is selected from the Security section of the WINBIOS Setup main menu, AMIBIOS issues a warning when any program (or virus) issues a Disk Format command or attempts to write to the boot sector of the hard disk drive. The settings are Enabled or Disabled. If enabled, the following appears when a write is attempted to the boot sector. You may have to type N several times to prevent the boot sector write. Boot Sector Write!!! Possible VIRUS: Continue (Y/N)? _
The following appears after any attempt to format any cylinder, head, or sector of any hard disk drive via the BIOS INT 13 Hard Disk Drive Service: Format!!! Possible VIRUS: Continue (Y/N)? _

## 3.10 UTILITY

In the Utility, the following icons appear in this section of the WINBIOS Setup main screen --
**Color Set :** Color Set sets the Setup screen colors.

**Language :** If this feature is enabled, you can select WINBIOS Setup messages in different languages.

## 3.11 BIOS DEFAULTS

The icons of BIOS Defaults in this section permit you to select a group of settings for all WINBIOS Setup options. Not only can you use these icons to quickly set system configuration parameters, you can choose a group of settings that have a better chance of working when the system is having configuration-related problems.

**Original :** Choose the Original icon to return to the system configuration values present in WINBIOS Setup when you first began this WINBIOS Setup session.

**Optimal :** You can load the optimal default settings for the WINBIOS by selecting the Optimal icon. The Optimal default settings are best-case values that should optimize system performance. If NVRAM is corrupted, the Optimal settings are loaded automatically.

**Fail-Safe BIOS Setup Settings :** You can load the Fail-Safe WINBIOS Setup option settings by selecting the Fail-Safe icon from the Default section of the WINBIOS Setup main menu.

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

# *APPENDIX A.*

## *HOW TO USE WATCH-DOG TIMER*

To use the watch-dog timer :

**Step 1.** Enable and retrigger the Watch-Dog timer: **443H**

**Step 2.** Disable: **43H**

### EX.1: For DOS

Execute the **DEBUG.EXE** file under DOS, Then key-in **i443**. The system will reboot automatically according to the time-out you set.

```
C:\DOS> DEBUG
        -i443
```

### EX.2: For assemble Language

```
Enable      :
            :
            :
MOV DX, 443H
IN AL, DX
            :
            :

Disable     :
            :
            :
IN AL, 43H
            :
            :
```

# APPENDIX B.

## TECHNICAL REFERENCE

**I/O PORT ADDRESS MAP**

| Address | Function |
|---|---|
| 000 - 01F | DMA Controller #1 |
| 020 - 03F | Interrupt Controller #1 |
| 040 - 05F | Timer Chip |
| 043 | Disable Watch-Dog Times Operation (Read) |
| 060 - 06F | Keyboard Controller |
| 070 - 07F | Read Time Clock/NMI Mask |
| 080 - 09F | DMA Page Register |
| 0A0 - 0BF | Interrupt Controller #2 |
| 0C0 - 0DF | DMA Controller #2 |
| 0F0 - 0F1 | Clear/Reset Math Coprocessor |
| 1F0 - 1F7 | Hard Disk Controller |
| 200 - 210 | Game Port |
| 278 - 27F | Parallel Port #2 |
| 2E8 - 2EF | Serial Port #4 (COM 4) |
| 2F8 - 2FF | Serial Port #2 (COM 2) |
| 300 - 31F | prototype Card/Streaming Tape Adapter |
| 360 - 36F | PC Network |
| 378 - 3FF | Parallel Port #1 |
| 380 - 38F | SDLC #2 |
| 3A0 - 3AF | SDLC #1 |
| 3B0 - 3BF | MDA Video Card (Including LPTO) |
| 3C0 - 3CF | EGA Card |
| 3D0 - 3DF | CGA Card |
| 3E8 - 3EF | Serial Port #3 (COM 3) |
| 3F0 - 3F7 | Floppy Disk Controller |
| 3F8 - 3FF | Serial Port #1 (COM 1) |
| 443 | Enable Watch-dog Timer Operation (read) |

**MEMORY ADDRESS MAP**

| Address Range (Hex) | Description |
|---|---|
| 000000H - 09FFFFH | 640 KB of Conventional RAM |
| 0A0000H - 0BFFFFH | 128 KB of Video RAM |
| 0C0000H - 0EFFFFH | 256 KB of I/O Expansion ROM |
| 0F0000H - 0FFFFFH | 64 KB of System BIOS ROM |
| 0100000H - 7FFFFFFFH | 1 MB ~ 128MB of User RAM |

**DMA CHANNELS**

| CHANNEL | Function |
|---|---|
| DMA 0 | Reserved |
| DMA 1 | Reserved |
| DMA 2 | Floppy Disk Controller |
| DMA 3 | ECP Parallel Port |
| DMA 4 | Cascade for DMA #1 |
| DMA 5 | Reserved |
| DMA 6 | Reserved |
| DMA 7 | Reserved |

**INTERRUPT CONTROLLER**

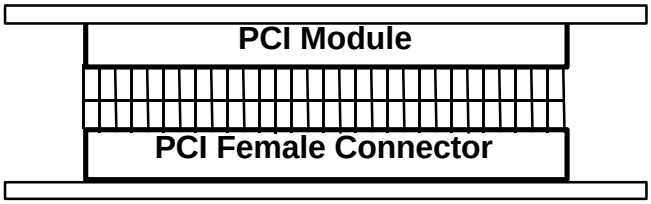
| IRQ | Function |
|---|---|
| IRQ 0 | System timer output |
| IRQ 1 | Keyboard |
| IRQ 2 | Cascade for INTC #2 |
| IRQ 3 | Serial port #2 |
| IRQ 4 | Serial port #1 |
| IRQ 5 | Parallel port #2 |
| IRQ 6 | Floppy disk controller |
| IRQ 7 | Parallel port #1 |
| IRQ 8 | Real time clock |
| IRQ 9 | Software redirected to INT 0AH (IRQ 2) |
| IRQ 10 | Reserved |
| IRQ 11 | Reserved |
| IRQ 12 | PS/2 Mouse |
| IRQ 13 | Math Coprocessor (CPU Internal) |
| IRQ 14 | Primary Hard disk |
| IRQ 15 | Secondary Hard Disk |
| NMI | Parity Check Error |

# *APPENDIX C.*

## *PC/104 MODULE INSTALLATION*

There are two steps to install the PC/104 module on AP-545L Single Board Computer.

**Step 1.** Plug the Dual Side Male Connector into the PC/104 female connector.
**Step 2.** Plug the PC/104 module‘ s female connector into the AP-545L male connector.




**Dual-Side Male Connector**

**AP-545L Single Board Computer**

# *GLOSSARY*

**8-Bit Bus –** Data is transmitted to expansion slots and other components on the bus only along 8 parallel data line.

**10Base-T –** It is a 10Mbps IEEE 802.3/Ethernet standard that uses unshielded twisted pair cable specification. 10Base-T supports network configuration using the CSMA/CD access method over a twisted pair transmission system up to 100 meters in length without the use of repeater.

**16-Bit Bus or ISA Bus –** Data is transmitted along either 8 or 16 data lines, depending on what kind of adapter card is used in an expansion slot. ISA is the abbreviation of Industry Standard Architecture.

**100Base-TX –** It is a 100Mbps IEEE 802.3/Ethernet standard that uses UTP cable. Also called Fast Ethernet, it uses RJ-45 connectors and EIA/TIA T568B pinning. Maximum cable length from hub to node is 100 meters without a repeater.

**Adapter –** It is also called an expansion board, expansion card, or adapter card. It is a small circuit board that is installed in the expansion slots on the motherboard. You can install a particular adapter that connects a new device such as internal modem, sound card, and scanner.

**AGP (Advanced Graphic Port ) –** is a new 32-bit interface, with external clock rate of 66MHz that transmit a maximum of 528MB of data. It has a clock speed of 133MHz, which is four times the speed of PCI interface.

**BIOS (Basic Input /Output System) –** This is a chip on the motherboard that contains the instructions for starting up, or booting, the computer, and more.

**Bus –** Data that travels in a computer along the circuits on the motherboard are called buses. Although three main buses (data bus, address bus, and control bus) manage the computer' s operation, often these are collectively called the bus. The bus carries instructions back and forth between the CPU and other devices in the system. ISA, EISA, VL-Bus, PCI and SCSI are examples of PC buses.

**bps –** Bits per second. Also often preceded by K (kilo/thousands), **Kbps** – Kilo bytes per second, and M (mega/million), **Mbps** – Mega bytes per second.

**Bus Mastering –** A method of transferring data through a bus in which the device takes over the bus and directly controls the transfer of data to the computer' s memory. Bus mastering is a method of Direct Memory Access (**DMA**) transfer.

**Cache –** Cache RAM is an extra holding area for program instructions that need to be frequently used by the CPU or swapped in and out of RAM. Your CPU can usually access those instructions from the cache more quickly than it could from a hard disk or even RAM, so a cache helps the system work more efficiently. Most systems sold today offer either 256K or 512K cache.

**CPU (Central Processing Unit) –** executes all commands and controls the flow of data, providing the " brain " that enables the PC to calculate and perform the operations like sorting information more quickly than a human could. The CPU makes perhaps the greatest contribution to a PC' s speed and power. Note: Any additional information is subject to change without prior revision from the supplier.

**Table 1 -- CPU Speeds**

| Processor type | Speed ratings (MHz) |
|---|---|
| 486DX2 | 66, 80 |
| 486DX4 | 75, 100, 120 |
| Pentium | 90, 100, 120, 133, 166, 200 |
| Pentium MMX | 166, 200, 233 |
| Pentium Pro | 166, 180, 200 |
| Pentium II | 233, 266, 300, 333 |

**EIDE (Enhanced IDE) –** It is a hard drive controller that enables your system to be able to handle fast hard disk drives at a speed of 10Mbps.

**EISA or MCA Bus –** Data is transmitted along 32 data lines to adapter cards designed specifically to work with the 32-bit buses. MCA expansion slots cannot accept 8-bit or 16-bit adapter cards. EISA stands for Extended Industry Standard Architecture, while MCA stands for MicroChannel Architecture. MCA is architecture used in IBM Microcomputer.

**Expansion slots –** Expansion slots are plug-in connectors that allow you to insert additional circuit boards that attach to the rest of the PC through special circuitry called the **bus**. By inserting the right circuit board -- usually called an **adapter** or an **expansion card** – you can increase the resolution and the number of colors used by the display, or you can transform your PC into a machine for recording and playing music.

**Fast SCSI –** The common nomenclature associated with SCSI-2, the second generation of SCSI offering mandatory parity checking improvements over SCSI-1.

**IDE (Integrated Drive Electronics) –** It was developed from ST-506 type hard drive interface, utilizes BIOS INT 13h hard drive secondary software and supports two hard drives (Master and Slave). Do not need extra software to drive since it is directly initiated in the BIOS. Data transfer rate is 4.1 Mbps. Take note that this interface cannot support other drive like CD-ROM drive.

**IEEE (Institute of Electrical and Electronic Engineers) –** It is an international professional society that issues its own standard, and is a member of ANSI and ISO. Popular known standards is:

**IEEE802.3** – is a physical layer standard for 10Base-T, 100Base-T, Ethernet, and StarLAN.
**IEEE802.5** – is a physical layer standard for Token Ring.
**IEEE802.11** – is a physical layer standard for Wireless LAN/WAN compatibility.
**IEEE802.12** – is a physical layer standard for 100VG AnyLAN.

**LAN (Local Area Network) –** A data communications network spanning a limited area. It provides communications between three or more computers and peripherals, in most cases using a high-speed media as it' s backbone.

**Keyboard –** This is a component that comes in direct contact for you with your PC. The mechanism of keyboard converts a key cap' s movement into a signal sent to the computer. The most common key mechanism are " **capacitate** " and " **hard contact** ". Capacitate keyboard has a spring that causes the plastic and the metal plunger to move nearer to two pads that have large plates (plated in tin, nickel, and copper). These pads are connected to the keyboard' s printed circuit board. Hard contact keyboard causes the key cap to collapse a foam rubber dome that presses against a sheet of plastic on the bottom of which is metallic area connected to the rest of the keyboard' s

circuit board.

**LDCM (LANDesk Client Manager) –** With the help of LDCM, PCs that are either stand-alone or on a network can not escape the control of a system administrator. Alerts will be sent to the user if an abnormal condition is encountered in a PC. It allows the administrator to give each PC a thorough check-up. Additionally, this feature is available to multiple OS' s on the market today. LDCM Key Features include the following : Health Monitoring, Real-Time Alerting, Remote Accessibility, Extensive Instrumentation. This is a product from Intel.

**Mouse –** The keyboard is a barrier to learn how to use a computer. Xerox Corporation first developed the concept of a pointing device, something a computer user could move with his or her hand, causing a corresponding move on screen. Because of its size and tail like cable, the device was named for the mouse. Apple Computer made the mouse a standard feature of its Macintosh computers, and with the popularity of Windows, a mouse is becoming standard equipment on all PCs, as well. The " **Trackball** " have survived more awkward methods of navigating with the keyboard. " **Digitizing tablets** " are popular with architects and engineers who must translate precise movements of a pen into lines on the screen. " Touch screens ", on which you press either your finger and a special light pen to control the software, are too tiring to use for any length of time.

**MMX – –** CPU' s with MMX technology are optimized to run multimedia application, and therefore, offer faster multimedia playback than standard CPUs. However, when manufacturers introduce any new hardware technology, the software makers need to catch up. At this time of compilation, most applications can' t yet take advantage of MMX capabilities.

**Parallel port –** Parallel ports (labeled **LPT1**, **LPT2**, and so on) are usually for plugging in printers. It is also often called a **Centronics port** – has been almost synonymous with **printer port**. Although a serial port can also be used to send data from a PC to some models of printers, the parallel port is faster. A serial port sends data one bit at a time over a single one-way wire; a parallel port can send several bits of data across eight parallel wires simultaneously. Take note that a serial connection sends a single bit, a parallel port send an entire byte. A parallel connection has one drawback.

**PCI Bus (Peripheral Component Interconnect) –** It is a connection slot in a motherboard that supports 32-bit bus transfer rates. The now standard PCI Local Bus carries data along at least 32 lines, that is, at least 32 bits at a time. Local bus computer designs add special buses so the CPU can communicate directly with key components like the monitor, resulting in much better performance. You should look for PCI local bus capabilities in any system you buy, especially PCI local bus video (which helps the monitor display more quickly).

**POST (Power-On Self-Test) –** is the first thing your PC does when you turn it on, and it's your first warning of trouble with any of the components. When the POST detects an error from the display, memory, keyboard, or other basic components, it produces an error warning in the form of a message on your display and —in case your display is part of the problem —in the form of a series of beeps.

**RAM (Random Access Memory) –** consists of a bank of chips that act as "working memory", holding program instructions and data only while your computer's on. Unless the instructions and data are saved to a disk, RAM forgets them when you turn your computer off. RAM is measured in megabytes (M). Most computers today come with 32M of RAM, though some sell with only 16M installed. There are a few different flavors and speeds of RAM, as well. One of the most prominent today is Extended Data Output ( EDO ) RAM, but an even faster type of RAM that has just hit the market is called **SyncDRAM**.

**Serial port –** Serial ports are also sometimes called **COM** (short for COMmunications) ports, and are labeled **COM1**, **COM2**, and so on. It is simple in concept: one line to send data, another line to receive data, and a few other lines to regulate how data is sent over the other two lines – from commonplace modems and printers to plotters and burglar alarms. The most common use for serial port is with a **mouse** or **modem**. The reason for this is that a serial port is not a very efficient way to transfer data, so little data that speed is not crucial, and perfect for modems because. With current technology, phone lines cannot transport more than one signal at a time anyway. The **serial port** is often referred to as an **RS-232 port**.

**SCSI (Small Computer System Interface) –** An intelligent bus for transmitting data commands between a variety of devices. There are many implementations of SCSI, including Fast SCSI, Wide SCSI, Fast Wide SCSI, Fast-20, and Fast-40.

**SCSI-2 –** The second generation of SCSI; includes many improvements to SCSI-1, including Fast SCSI, Wide SCSI, and mandatory parity checking.

**SCSI-3 –** The third generation of SCSI; introduces Fast-20 and Fast-40 as improvements to the parallel bus. The standard also includes a number of specifications for high-speed serial bus architectures such as SSA, Fiber Channel, and IEEE 1394. Also known as Ultra SCSI.

**Ultra SCSI –** Also known as SCSI-3, is a third generation SCSI standard that introduced parallel bus speed improvements (FAST-20 and FAST-40), an the miniaturized 68-pin micro connector.

**USB (Universal Serial Bus) –** USB consolidates serial, parallel, keyboard, mouse, and game ports into one asynchronous and isochronous communications port with bandwidth for data transfer speeds up to 12 Mbps without termination. By daisy-chaining USB hubs, up to 127 I/O devices can be connected to one USB port on the PC. USB is completely plug-and play meaning peripherals can be correctly detected and configured automatically as soon as they are connected.

**UTP (Unshielded Twisted Pair) –** Twisted pair cable with neither individual nor overall shielding. **Twisted Pair** are two wires twisted together to reduce susceptibility to RF crosswalk.

**VGA (Video Graphics Array) –** A video adapter that supports 640x480 pixels color resolution. The Windows OS provides medium text & graphics standard.

**VL-Bus –** It is also known as Local Bus; this is an I/O interface that is directly connected and depended of the system CPU. The VL-Bus is an abbreviation of VESA Local Bus.

# Terms and Conditions

**Date:1997.10.20**

## Warranty Policy

1. All products are warranted against defects in materials and workmanship on a period of two years from the date of purchase by the customer.
2. The buyer will bear the return freight charges for goods that are returned for repair within the warranty period whereas manufacturer will bear the other way after repair.
3. The buyer will pay for repair (for the replaced materials plus service time) and transportation charges (both ways) for items after the expiration of the warranty period.
4. If the RMA Service Request Form does not meet the stated requirement as listed on " RMA Service " , RMA goods will be returned at the customer expense.
5. The following conditions are excluded from this warranty **:**
   A. Improper or inadequate maintenance by the customer.
   B. Unauthorized modification or misuse.
   C. Operation outside of the environmental specifications for the product.

## RMA Service

***1. Request a RMA#* :**

Complete and fax to Supplier the " RMA Request Form" to obtain a RMA number.

***2. Shipping:***

A. The customer is requested to fill up the problem code as listed . If none of the code is selected, please write the symptom description on the remark.

B. Ship the defective units with freight prepaid.

C. Mark the RMA # clearly on the box.

D. Shipping damage as a result of inadequate packing is the customer's responsibility.

E. Use the original packing materials whenever possible .

***3. All RMA# are valid for 30 days only:***

When RMA goods are received after valid RMA# period , the goods will be rejected.

# RMA Service Request Form

***Date:1997.10.20***

***When requesting RMA service, please fill out this "RMA Service Request Form". This form needs to be shipped with your returns. Service cannot begin until we have this information.***

| | |
|---|---|
| Company: | Person to contact: |
| Phone No. | Purchased Date: |
| Fax No.: | Applied Date: |
| Return Shipping Address _____ | |
| _____ | |
| ***For Supplier only** | **RMA No:** |
| | **Account Sales:** |

| Model No. | Serial No. | Problem Code | Remark |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | *This form could be copied for more description |

***Problem Code**:

01:D.O.A.
02: Second Time R.M.A.
03: No Screen
04: CMOS Data Lost
05: FDC Fail
06: HDC Fail
07: Bad Slot
08: BIOS Problem
09: Keyboard Controller Fail
10: Cache RMA Problem
11: Memory Socket Bad
12: Hang Up Hardware
13: Hang Up Software
14: Other ( Pls. Specify )

***Request Party*** ***Confirmed By Supplier***

**Authorized Signatures** **Authorized Signatures**