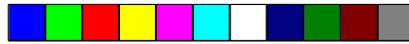


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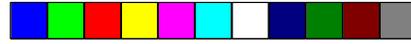


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 Tomcat IV, S1564.





# 1. Introduction

## 1.1 Overview

The S1564S/D is a quality, high performance single or dual processor mainboard based on the powerful Intel Pentium microprocessors. This mainboard is designed around the Intel 430HX chipset and can support CPU speeds of 75MHz through 233MHz and beyond. The S1564S is single processor mainboard and the S1564D is a dual processor mainboard.

The S1564 incorporates a switching power supply that allows support for single or dual Pentium/Pentium MMX processors, single Cyrix processors, and single AMD processors. It also supports EDO/FPM memory, ECC memory and memory parity checking. The S1564's PCI Local Bus provides high performance capabilities that are ideal for a wide range of demanding applications such as: CAD, CAM, CAE, networking, multi-user environments, database management, desktop publishing, image processing and 3D animation.

This integrated system board achieves the highest reliability and yet is small enough for all of its features to be supported in a "Baby-AT" form-factor. Some of the features included are: on-board dual channel PCI IDE, on-board floppy controller, on-board high speed I/O, and support for pipeline-burst SRAM.

Flexibility and expandability have been designed into the S1564. With I/O and drive controller support built on-board, the four PCI and five ISA (One ISA and one PCI as a shared slot) slots are free for any add-on expansion cards. With eight SIMM sockets, the S1564 can provide a very flexible memory configuration of 8MB to 512MB of RAM. With the S1564D's support for dual Pentium processors, you can start a system with just one CPU, and later add another, when more processing power is required.

To provide you safer way of operating your system, Tyan has also incorporated LM78 (Option) System Hardware Monitor and Intel LANDesk™ Client Manager (LDCM) into the S1564S/D board design (See Appendix for details).



## 1.2 Hardware Specifications/Features

- CPU*
- Intel Pentium/Pentium MMX 75MHz thru 233MHz  
(Single or Dual CPU configuration)
  - Cyrix/IBM 6x86 P120+, P150+, P166+ (Single CPU Only)
  - AMD K5 75MHz thru 166 MHz (Single Only)
  - AMD K6 166MHz thru 233MHz (Single Only)
- Speed*
- 50/60/66 MHz system bus
  - 25/30/33 MHz PCI bus
  - 7.5/8.33 MHz ISA bus speed
- DRAM*
- 4 double banks of 72 pin SIMM sockets
  - Supports 5V or 3.3V memory
  - Supports EDO (Exended Data Out) DRAMs
  - Supports ECC (Parity 36-bit w/algorithm)
  - Supports Fast Page Mode DRAMs
  - Supports 8MB to 512MB of DRAMs
- L2 Cache*
- 512KB on board 2nd level cache memory
  - Supports synchronous pipeline-burst mode
- EIDE Controller*
- Primary and secondary PCI EIDE channels on board for support of up to four EIDE Mode 0 through Mode 4 hard drives/CDROMs
  - Supports DMA (Busmaster) mode 1 and 2.  
( Busmaster driver on web at [www.tyan.com](http://www.tyan.com))
- Enhanced I/O*
- Multi-mode bi-directional parallel port that
  - Supports standard, EPP and ECP modes.
  - Supports 16550 compatible UARTS for 2 on-board high speed serial ports.
  - Support for an IrDA compliant InfraRed interface.
  - On-board dual floppy controller. (up to 2.88Mb)
  - Twin on-board USB headers (for use with Tyan PN# S1606-001-01)





*Mouse*

- On-board PS/2 mouse header (for use with PS/2 mouse connector + cable - Tyan PN# S1607-001-01)

*Expansion*

- 4 32-bit Busmastering PCI slots
- 5 16-bit ISA slots  
(One ISA and one PCI shared slot)

### 1.3 Software Specifications

*BIOS*

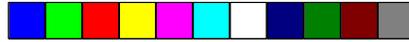
- Licensed Award or AMI BIOS
- AT CMOS setup, BIOS/CHIPSET setup, and hard disk utility included.
- Support for easy BIOS upgrades with flash EEPROM chip.

*O.S.*

- Operates with MS-DOS, Windows 3.x, Windows for Workgroups 3.x, Windows 95, Windows NT, OS/2, Novell Netware, Novell UnixWare 1.1, SCO Unix, Linux, and Solaris.

**TYAN is certified under Solaris**





## 2. Board Installation

### 2.1 Unpacking

The mainboard package should contain the following:

- One S1564S or S1564D Mainboard
- One IDE 40 pin cable
- Two serial cables (on bracket)
- One parallel cable (on bracket)
- One 34 pin floppy cable
- One User's Manual

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

With the power supply plugged in and turned off touch an unpainted area of the system chassis immediately before handling the mainboard or any component. Doing so discharges the static charge your body may have built up.

After opening the mainboard carton, extract the system board holding it by its edges, and place it only on a grounded anti-static surface, component side up. 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 with the board placed on an anti-static mat. Do not touch the bottom of the board.

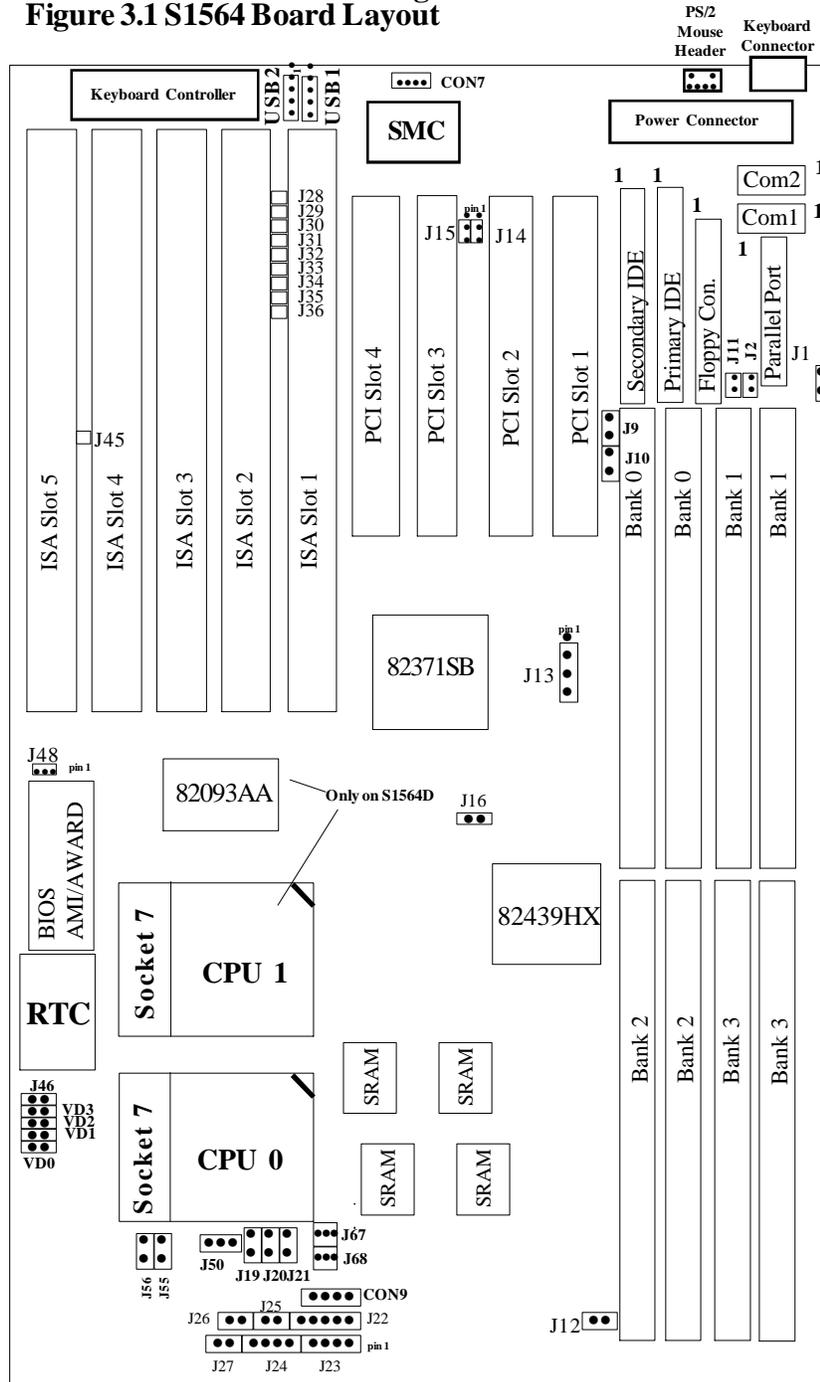
**DO NOT APPLY POWER TO THE BOARD IF IT HAS BEEN DAMAGED!**

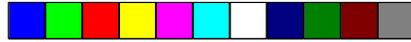
### 2.2 Installation

You are now ready to install your mainboard. The mounting hole pattern of the S1564S/D matches the "Baby AT" system board spec. It is assumed that the chassis is for a standard IBM XT/AT form factor.

### 3. On Board Resource Setting

#### Figure 3.1 S1564 Board Layout





### 3.2 Jumper Settings

#### Pentium (P54C)

J13	J19	J20	J21	VIO	CPU Speed	
1-2, 3-4	Off	Off	Off	OFF	75 MHz	
3-4	Off	Off	Off	OFF	90 MHz	
1-2	Off	Off	Off	OFF	100 MHz	
3-4	On	Off	Off	OFF	120 MHz	==>Cyril P150+
1-2	On	Off	Off	OFF	133 MHz	==>Cyril P166+
3-4	On	On	Off	OFF	150 MHz	
1-2	On	On	Off	OFF	166 MHz	
1-2	Off	On	Off	OFF	200 MHz	
1-2, 3-4	On	Off	Off	OFF	100 MHz	==>Cyril P120+

#### Pentium MMX (P55C)

J13	J19	J20	J21	VIO	CPU Speed
1-2	ON	ON	OFF	ON	166 MHz
1-2	OFF	ON	OFF	ON	200 MHz
1-2	OFF	OFF	OFF	ON	233 MHz

#### AMD K6

J13	J19	J20	J21	VIO	CPU Speed
1-2	ON	ON	OFF	ON	166 MHz
1-2	OFF	ON	OFF	ON	200 MHz
1-2	OFF	OFF	OFF	ON	233 MHz

#### CPU Voltage Select

All Pentium P54C and AMD K5 ==>>> 3.5V

All Pentium MMX P55C =====> 2.8V

AMD K6-PR166 and K6-PR200====> 2.9V

AMD K6-PR233 =====> 3.2V

	VD0	VD1	VD2	VD3
2.8V	OFF	OFF	OFF	ON
2.9V	ON	OFF	OFF	ON
3.2V	OFF	OFF	ON	ON
3.3V	ON	OFF	ON	ON
3.4V	OFF	ON	ON	ON
3.5V	ON	ON	ON	ON



**CMOS Reset: J46**

Off: Normal operation(Default)  
 On: Clears password and resets CMOS

- ◆With power off, put jumper on J46 for about 10 seconds.
- ◆Remove jumper and power system on and the CMOS will be reset.

**APIC For DP: J50 (Dual CPU Jumper for S1564D only)**

	J50	
Dual CPU	2-3	Default
Single CPU	1-2	

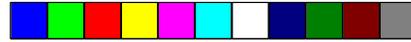
\*Note: When using two Pentiums, Intel recommends that the chips have the same s-spec number. These numbers are stamped on the top and bottom of the Pentium chips. Check with your CPU vendor for more info about s-spec numbers.

**DRAM Voltage Setting: J1, J2, J11, J12, J8, J9, & J10**

Damage to system can result if these are set incorrectly!

	Volts	J1	J2	J11	J12	J8	J9	J10
Default	5V	On	On	On	On	Off	Off	Off
	3.3V	Off	Off	Off	Off	On	On	On





### I/O Selection: J14 & J15

	J14	J15
For COM 1 / 2	1-2(ON), 2-3(OFF)	1-2(ON), 2-3(OFF)
For InfraRed	1-2(OFF), 2-3(ON),	1-2(OFF), 2-3(ON)

### Speaker Connector: J23

Pinout Assignments	
1	Speaker out
2	Ground
3	Ground
4	+ 5V

### Keylock Connector: J22

Pins 1 to 3 for power LED.

Pins 4 and 5 for Keylock

Pinout Assignments	
1	Led Output
2	No Connect
3	Ground
4	Keylock
5	Ground

### Turbo Switch: J26 ( Non-Turbo Mode Not Supported )

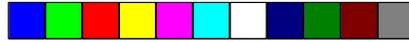
**CPU FAN 1: J67 (PIN 2 is +12V)**

**CPU FAN 2: J68 (PIN 2 is +12V)**

### HDD LED: J24

Pinout Assignments	
1	Cathode
2	Anode
3	Cathode
4	Anode

Pins 1 and 2 are for primary IDE channel.  
Pins 3 and 4 are for secondary IDE channel.



**Reset Connector: J27**

Pinout Assignment	
1	Power Good
2	Ground

**Turbo LED Connector: J25**

Pinout Assignment	
1	Cathode
2	Anode

**Flash EEPROM: J48**

This jumper should be left at the factory default.

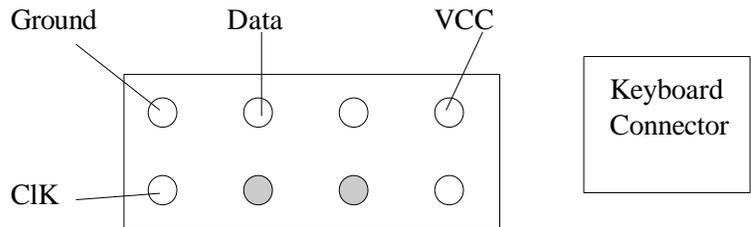
**J48**

	1-2	2-3
5V	ON	OFF
12V	OFF	ON

**InfraRed Interface: Con7 and Con9**

Pinout	Assignment
1	Signal In
2	Gnd
3	Signal Out
4	VCC

**PS/2 Pinout(J5):**





### 3.3 CMOS RTC

CMOS RTC includes an internal battery and Real Time Clock circuit. It provides the date and the time for the system. Normally the life span of a RTC internal battery is 10 years. When replacing, you should use the same model.

### 3.4 Speaker Connector Installation

S1564 provides a 4-Pin header (J23) to connect the speaker. The polarity can go either way.

### 3.5 Turbo Switch

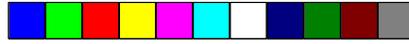
The front panel on your case may have a turbo switch to control system speed when slower program execution is required for software developed in the old XT days.

The Intel 430HX chipset doesn't support a de-turbo mode, but the S1564 has a connector (J26) for the cable that may come with the case.

### 3.6 Turbo LED Connector Installation

The TURBO LED on the front case panel can indicate the current speed status of the system. The TURBO LED connector should be installed to J25 in the correct direction.





### 3.7 Hardware Reset Switch Connector Installation

The RESET switch on your cases' display panel provides users with the HARDWARE RESET function which is the same as power on/off. The system will do a cold start after the RESET switch is pushed by the user. The RESET switch is a 2 pin connector and should be installed on jumper J27.

### 3.8 Flash EEPROM-Jumper J48

The S1564 uses flash memory to store BIOS data. It can be updated as new versions of the BIOS becomes available. The flash utility will guide you through the process step by step. If your system is functioning properly, you may want to forego updating your BIOS in the event the new one causes problems with your existing hardware and software.

J48 determines which type of EPROM is used. This jumper have been set to match the on board BIOS chip. The factory default for the S1563 is on pins 1-2.

**Refer to chapter 6 for Flash EEPROM upgrade procedures.**

### 3.9 Hardware CMOS & Password Reset

(The following steps are valid provided the board has a DS12887A RTC)

If you have been locked out of your system because you forgot your password or set the CMOS incorrectly, follow the instructions below.

- a. Power off the system
- b. Short jumper J46.
- c. Wait for 5 seconds then remove the jumper from J46.
- d. Then power on the system again.

By doing the above procedures, your password will be erased and the CMOS will be reset to the BIOS defaults.

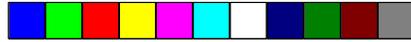
### 3.10 DRAM Installation

The S1564 uses a 64-bit data path from memory to CPU and can accommodate up to 512 MB of RAM. The mainboard supports standard, EDO (Extended Data Out) and ECC(Error Correcting Code) 72 pin SIMMS . All installed memory will be automatically detected so there is no need to set jumpers.

- ◆SIMM modules must be installed in pairs.
- ◆Each pair of SIMMs must be of the same size and type.
- ◆The mainboard supports 1, 2, 4, 8 and 16MBx32 SIMMS.
- ◆The table below shows some of the available memory configurations.

Bank0	Bank1	Bank2	Bank3	Total Memory In Bank			Total
				0	0&1	0,1&2	
1MB*2	(1MB*2)	(1MB*2)	(1MB*2)	2MB	4MB	6MB	8MB
1MB*2	(2MB*2)	(2MB*2)	(2MB*2)	2MB	6MB	10MB	14MB
1MB*2	(4MB*2)	(4MB*2)	(4MB*2)	2MB	10MB	18MB	26MB
1MB*2	(8MB*2)	(8MB*2)	(8MB*2)	2MB	18MB	34MB	50MB
1MB*2	(16MB*2)	(16MB*2)	(16MB*2)	2MB	34MB	66MB	98MB
1MB*2	(32MB*2)	(32MB*2)	(32MB*2)	2MB	66MB	130MB	194MB
1MB*2	(64MB*2)	(64MB*2)	(64MB*2)	2MB	130MB	258MB	386MB

2MB*2	(1MB*2)	(1MB*2)	(1MB*2)	4MB	6MB	8MB	10MB
2MB*2	(2MB*2)	(2MB*2)	(2MB*2)	4MB	8MB	12MB	16MB
2MB*2	(4MB*2)	(4MB*2)	(4MB*2)	4MB	12MB	20MB	28MB
2MB*2	(8MB*2)	(8MB*2)	(8MB*2)	4MB	20MB	36MB	52MB
2MB*2	(16MB*2)	(16MB*2)	(16MB*2)	4MB	36MB	68MB	100MB
2MB*2	(32MB*2)	(32MB*2)	(32MB*2)	4MB	68MB	132MB	196MB
2MB*2	(64MB*2)	(64MB*2)	(64MB*2)	4MB	132MB	260MB	388MB



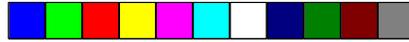
Total Memory In Bank

Bank0	Bank1	Bank2	Bank3	0	0&1	0,1&2	Total
4MB*2	(1MB*2)	(1MB*2)	(1MB*2)	8MB	10MB	12MB	14MB
4MB*2	(2MB*2)	(2MB*2)	(2MB*2)	8MB	12MB	16MB	20MB
4MB*2	(4MB*2)	(4MB*2)	(4MB*2)	8MB	16MB	24MB	32MB
4MB*2	(8MB*2)	(8MB*2)	(8MB*2)	8MB	24MB	40MB	56MB
4MB*2	(16MB*2)	(16MB*2)	(16MB*2)	8MB	40MB	72MB	104MB
4MB*2	(32MB*2)	(32MB*2)	(32MB*2)	8MB	72MB	136MB	200MB
4MB*2	(64MB*2)	(64MB*2)	(64MB*2)	8MB	136MB	264MB	392MB

8MB*2	(1MB*2)	(1MB*2)	(1MB*2)	16MB	18MB	20MB	22MB
8MB*2	(2MB*2)	(2MB*2)	(2MB*2)	16MB	20MB	24MB	28MB
8MB*2	(4MB*2)	(4MB*2)	(4MB*2)	16MB	24MB	32MB	40MB
8MB*2	(8MB*2)	(8MB*2)	(8MB*2)	16MB	32MB	48MB	64MB
8MB*2	(16MB*2)	(16MB*2)	(16MB*2)	16MB	48MB	80MB	112MB
8MB*2	(32MB*2)	(32MB*2)	(32MB*2)	16MB	80MB	144MB	208MB
8MB*2	(64MB*2)	(64MB*2)	(64MB*2)	16MB	144MB	272MB	400MB

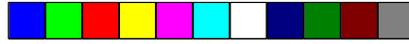
16MB*2	(1MB*2)	(1MB*2)	(1MB*2)	32MB	34MB	36MB	38MB
16MB*2	(2MB*2)	(2MB*2)	(2MB*2)	32MB	36MB	40MB	44MB
16MB*2	(4MB*2)	(4MB*2)	(4MB*2)	32MB	40MB	48MB	56MB
16MB*2	(8MB*2)	(8MB*2)	(8MB*2)	32MB	48MB	64MB	80MB
16MB*2	(16MB*2)	(16MB*2)	(16MB*2)	32MB	64MB	96MB	128MB
16MB*2	(32MB*2)	(32MB*2)	(32MB*2)	32MB	96MB	160MB	224MB
16MB*2	(64MB*2)	(64MB*2)	(64MB*2)	32MB	160MB	288MB	416MB

32MB*2	(1MB*2)	(1MB*2)	(1MB*2)	64MB	66MB	68MB	70MB
32MB*2	(2MB*2)	(2MB*2)	(2MB*2)	64MB	68MB	72MB	76MB
32MB*2	(4MB*2)	(4MB*2)	(4MB*2)	64MB	72MB	80MB	88MB
32MB*2	(8MB*2)	(8MB*2)	(8MB*2)	64MB	80MB	96MB	112MB
32MB*2	(16MB*2)	(16MB*2)	(16MB*2)	64MB	96MB	128MB	160MB
32MB*2	(32MB*2)	(32MB*2)	(32MB*2)	64MB	128MB	192MB	256MB
32MB*2	(64MB*2)	(64MB*2)	(64MB*2)	64MB	192MB	320MB	448MB



Total Memory In Bank

Bank0	Bank1	Bank2	Bank3	0	0&1	0,1&2	Total
64MB*2	(1MB*2)	(1MB*2)	(1MB*2)	128MB	130MB	132MB	134MB
64MB*2	(2MB*2)	(2MB*2)	(2MB*2)	128MB	132MB	136MB	140MB
64MB*2	(4MB*2)	(4MB*2)	(4MB*2)	128MB	136MB	144MB	152MB
64MB*2	(8MB*2)	(8MB*2)	(8MB*2)	128MB	144MB	160MB	176MB
64MB*2	(16MB*2)	(16MB*2)	(16MB*2)	128MB	160MB	192MB	224MB
64MB*2	(32MB*2)	(32MB*2)	(32MB*2)	128MB	192MB	256MB	320MB
64MB*2	(64MB*2)	(64MB*2)	(64MB*2)	128MB	256MB	384MB	512MB



### 3.11 CPU Installation

Many types of Pentiums (75 thru 233 MHz) and Cyrix/AMD CPUs can be used on the S1564. Please refer to the previous pages for the correct CPU jumper settings for your board.

- ◆ The CPU is a sensitive electronic component and it can be easily damaged by static electricity. Do not touch the CPU pins with your fingers.
- ◆ When installing the CPU into the socket, match the CPU pins to the socket pins.
- ◆ Before the CPU is installed, the mainboard must be placed on a flat plane. You should be able to insert the CPU with minimal pressure. Do not push down hard, use firm pressure.
- ◆ **A cooling fan and heat sink assembly is required to protect the CPU from being damaged.**

1. Make sure the ZIF socket lever is up. To raise the lever, pull it out to the side a little and raise it as far as it will go. The top plate will slide back.
2. Align the CPU and socket Pin 1 corners. The pins on the bottom should align with the rows of holes in the socket.
3. Insert the CPU in the socket. It should insert easily. If it does not, adjust the position of the lever a little.
4. Press the lever down. The top plate will slide forward. You will feel some resistance as the pressure starts to secure the CPU in the socket. This is normal and will not damage the CPU. The lever should snap into place at the side of the socket.



### 3.12 Cache Memory

The S1564 comes with 512Kb of L2 synchronous pipeline burst SRAM. The S1564's L2 cache is surface mounted and can be enabled or disabled through the BIOS setup.

- ◆The BIOS will auto detect the cache size so a you don't need to change any jumpers.
- ◆The mainboard has an 11 bit tag built on board so cachability of main memory is to 512MB.



### 3.13 Understanding The Different Clock Speeds

The following chart shows the different CPU, mainboard and PCI frequencies. As you may have noticed, all the Intel Pentium CPUs use an internal clock multiplier(x3, x2.5, x2 or x1.5 Motherboard speed). All Cyrix 6x86 can only use a x2 clock multiplier.

Pentium Internal Clock	Mainboard Clock	PCI Bus Clock
75 MHz	50 MHz	25 MHz
90 MHz	60 MHz	30 MHz
100 MHz	66.67 MHz	33 MHz
120 MHz	60 MHz	30 MHz
133 MHz	66.67MHz	33 MHz
150 MHz	60 MHz	30 MHz
166 MHz	66.67 MHz	33 MHz
200 MHz	66.67 MHz	33 MHz

In the table above, the 50, 60 and 66.67 MHz figures are oscillator speeds that establish the external clock speed. The PCI Bus clock speed is fixed at one half of the mainboard clock speed. The 150MHz Pentium when set for 2.5x mode will achieve a 30MHz PCI bus speed but if it is set for 3x mode you will get a slower 25MHz PCI bus speed.

Since all of the Cyrix 6x86 CPU's use a x2 multiplier, the 100MHz P120+ must run on a 50MHz host bus. The PCI speed will then be at 25MHz.



### 3.14 Peripheral Device Installation

After all the jumpers on the mainboard have been set, then it can be mounted into the case. Then proceed to install the display card and any other peripheral devices.

If a PCI-Bus interface card is to be installed in the system, any one of the five PCI-Bus slots can support either a Master or a Slave device.

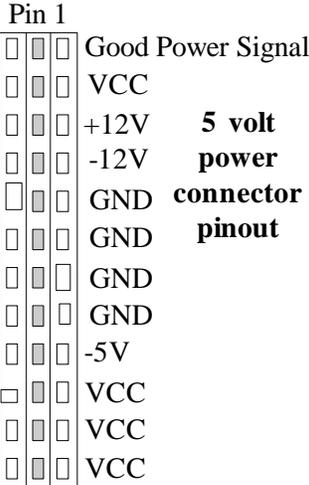
After installing the peripheral controllers, the user should check everything again, and prepare to power-on the system.





### 3.15 Connecting the Power Supply

The system power supply connectors on the mainboard is for a 5 volt power supply. Incorrect installation of the power supply could result in serious damage to the system board and connected peripherals.



To connect the leads from either voltage power supply, you should first make sure the power supply is unplugged. Most power supplies have two leads. Each lead has six wires, two of which are black.

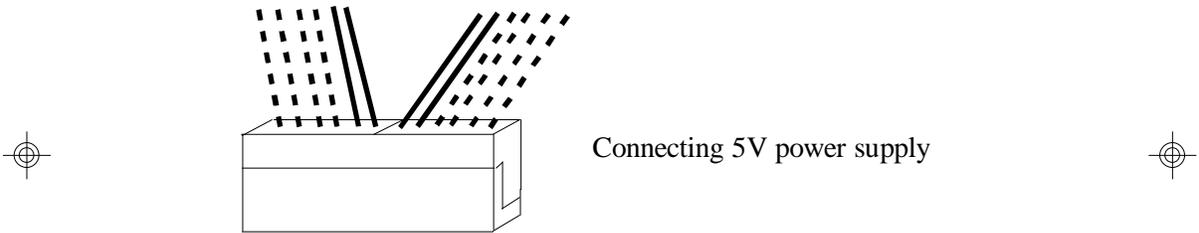
**Orient the connectors so the black wires are in the middle of the 5V power supply.**

**Caution: Some power supplies also include "3V" connectors. The connection wires normally have two colors with 3 black wires on one side. Please be very careful. Don't to use the wrong connector.**





Align the plastic guide pins on the lead cables to their receptacles on the mainboard. You may need to hold the lead at an angle to line it up. Once you have the guide pins aligned, press the lead connector so that the plastic clips on the lead snap into place and secure the lead to the connector.





## 4. BIOS Configuration

Award's BIOS has a built in setup program that allows the user to modify the basic system configuration. This type of information is stored in the battery-backed CMOS SRAM. **Entering incorrect information or forgetting your password can lock you out of your system.(refer to 3.15 for resetting of CMOS)**

### 4.1. Entering Setup

Power ON the computer and press <Del> immediately and you will 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 wish to enter Setup, restart the system by turning it OFF then ON or by pressing "Reset" 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, the system will not boot and an error message will appear on the screen. You will be asked to,

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

Figure 4.1 will appear on the screen. The Main Menu allows you to select from the 8 setup functions and 2 exit choices. Use the arrow keys to select among the items and press <Enter> to accept or enter the sub-menu.





## 4.2. Control Keys

PgUp key	Increases the numeric value or make changes
PgDn key	Decreases 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 a total of 16 colors
F3 key	Calendar, only for Status Page Setup Menu
F4 key	Reserved
F5 key	Restore the previous CMOS value, only for Option Page Setup Menu
F6 key	Load defaults
F8 key	Reserved
F9 key	Reserved
F10 key	Save all 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. Setup Page menu/Option Page Setup Menu

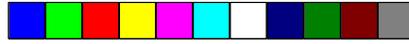
Press F1 to pop up a small help window that describes the appropriate keys to use and the possible selections for the highlighted items. To exit the Help Window, press <Esc>.

### 4.4. The Main Menu

Once you enter the Award BIOS CMOS Setup Utility, the Main Menu (Figure 4.4) will appear on the screen. The Main Menu allows you to select from the eight setup functions and 2 exit choices. Use the arrow keys to select among the items and press <Enter> to accept or enter the sub-menu.

**Figure 4.4: Main Menu**

ROM ISA BIOS (2A59CT51)	
CMOS SETUP UTILITY	
AWARD SOFTWARE, INC.	
STANDARD CMOS SETUP	LOAD SETUP DEFAULTS
BIOS FEATURED SETUP	PASSWORD SETTING
CHIPSET FEATURES SETUP	IDE HDD AUTO DETECTION
POWER MANAGEMENT	SAVE & EXIT SETUP
PCISLOT CONFIGURATION	EXIT WITHOUT SAVING
LOAD BIOS DEFAULTS	
ESC : Save & Exit Setup F10 : Quit	↑ ↓ → ← :Select Item (Shift)F2 :Change Color
Time, Date, Hard Disk Type,.....	



- ◆ **Standard CMOS setup**

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

- ◆ **BIOS features setup**

This setup page includes all of the enhanced features of Award's BIOS.

- ◆ **Chipset features setup**

This setup page includes all the items of the 430HX chipset features.

- ◆ **Power Management setup**

Change, set, or disable system power management options

- ◆ **PCI slot configuration**

This setup page allows you to modify the configuration of PCI slot parameters.

- ◆ **Load setup defaults**

BIOS defaults indicate the most appropriate values of each system parameter for your system.

- ◆ **Password setting**

Change, set, or disable password. It allows you to limit access to the system and Setup.

- ◆ **IDE HDD auto detection**

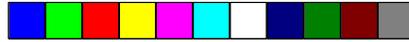
Automatically configure hard disk parameters.

- ◆ **Save and exit setup**

Save changes to CMOS and exit setup

- ◆ **Exit without saving**

Abandon all CMOS changes and exit setup.



## 4.5. Standard CMOS Setup Menu

The items in Standard CMOS Setup Menu (Figure 4.5) are divided into 9 categories. Each category includes one or more setup items. Use the arrows to highlight the item and use the <PgUp> or <PgDn> keys to select the value you want for each item.

**Figure 4.5: Standard CMOS Setup Menu**

ROM ISA BIOS (2A59CT51)																	
STANDARD CMOS SETUP																	
AWARD SOFTWARE, INC.																	
Date (mm:dd:yy) : Tue, Dec 7 1995																	
Time (hh:mm:ss) : 18 : 01 : 38																	
	Type	Size	CYLS.	HEADS.	PRECOMP.	LANDZONE	SECTORS										
Primary Master :	none	0mb	0	0	0	0	0										
Primary Slave:	none	0mb	0	0	0	0	0										
Secondary Master:	none	0mb	0	0	0	0	0										
Secondary Slave:	none	0mb	0	0	0	0	0										
Drive A : 1.44 M, 3.5 in.				<table border="1"> <tr> <td>Base Memory:</td> <td>640 K</td> </tr> <tr> <td>Extended Memory:</td> <td>7168 K</td> </tr> <tr> <td>Expanded Memory:</td> <td>0 K</td> </tr> <tr> <td>Other Memory:</td> <td>384 K</td> </tr> <tr> <td>Total Memory:</td> <td>8192 K</td> </tr> </table>				Base Memory:	640 K	Extended Memory:	7168 K	Expanded Memory:	0 K	Other Memory:	384 K	Total Memory:	8192 K
Base Memory:	640 K																
Extended Memory:	7168 K																
Expanded Memory:	0 K																
Other Memory:	384 K																
Total Memory:	8192 K																
Drive B : 1.2 M, 5.25 in.																	
Video : EGA/VGA																	
Halt On : All errors																	
ESC: Quit		↑ → ↓ ← : Select Item		PU/PD/+/-: Modify													
F1: Help		(Shift)F2: Change Color		F3: Toggle Calendar													

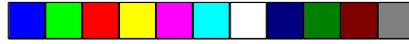
### ◆ Date

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

### ◆ Time

The time format is <hours>, <minutes>, <seconds>. The time is calculated based on the 24-hour military-time clock. For example 1 p.m. is 13:00:00.

Day	The day, from Sun to Sat, Determined by the BIOS date, month and year entries.
Date	The date, from 1 to 31 (or maximum allowed in a month)
Month	The month, Jan to Dec.
Year	The year, from 1900 to 2099



◆ **Primary/Secondary Drive type**

This category identifies the types of hard disk drives that have been installed in the computer. There are 46 predefined types and a user definable type.

Press PgUp or PgDn to select a numbered hard disk type or type a 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 type is not listed, you can Type User to define your own drive manually.

If you select Type User, you will be asked to enter the following info. Enter the parameters directly from the keyboard and press <Enter>. The hard disk information should be provided in the documentation from the hard disk vendor or the system manufacturer.

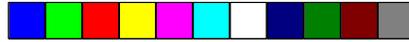
CYLS	number of cylinders
HEADS	number of heads
PRECOMP	written precom
LANDZONE	landing zone
SECTORS	number of sectors
Mode Normal	Access mode for IDE drives under 528MB
Mode LBA	Access mode for EIDE drives over 528MB
Mode Large	Access mode for IDE drives over 528MB that don't support LBA

If a SCSI hard disk has been installed or you have a CD-ROM/Tape drive connected to an IDE channel, select NONE and press<Enter>.

◆ **Drive A type/Drive B type**

This category identifies the types of floppy disk drive A or B, that have been installed in your 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
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



◆ **Video**

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

EGA/VGA	Enhanced Graphics Adapter/Video Graphics Array. For 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 hi-res monochrome.

◆ **Halt On**

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

All errors	Whenever the BIOS has detected a non-fatal error, the system will be stopped and you will be prompted.
No errors	The system boot will not be stopped for any errors that are detected.
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 disk errors; 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**

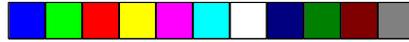
The category is for display-only and it is determined by POST Power On Self Test of the BIOS.

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 640K.

Extended Memory

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



### Expanded Memory

Expanded Memory (EMS) defines a 64 K page frame in the area between 640K and 1Mb containing four 16K pages that are windows into the EMS memory. Programs issue requests to the EMS manager to switch the page to any part of EMS memory. Extended memory can be converted to emulate EMS by using a memory manager such as EMM386 that ships with Windows and DOS.

### Other Memory

This refers to memory located in the 640K to 1024K address space. This memory can be used for different applications. DOS uses this area to load device drivers to keep as much conventional memory free for application programs as possible.

## 4.6. BIOS FEATURES SETUP

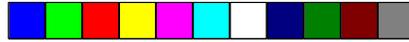


### ROM ISA BIOS BIOS FEATURES SETUP AWARD SOFTWARE, INC.



Virus Warning :Enabled	Video BIOS Shadow :Enabled
CPU Internal Cache :Enabled	C8000-CBFFF Shadow :Disabled
External Cache :Enabled	CC000-CFFFF Shadow :Disabled
Boot Sequence :A,C	D0000-D3FFF Shadow :Disabled
Swap Floppy Drive :Disabled	D4000-D7FFF Shadow :Disabled
Boot Up Floppy Seek :Enabled	D8000-DBFFF Shadow :Disabled
Boot Up NumLock Status :On	DC000-DFFFF Shadow :Disabled
Memory Parity Check :Enabled	
Gate A20 Option :Fast	ESC :Quit ↑ ↓ → ← :Select Item
Typematic Rate Setting :Disabled	F1 :Help PU/PD/+/- :Modify
Typematic Rate (Chars/sec) :6	F5 :Old Values (Shift)F2 :Color
Typematic Delay (msec) :250	F6 :Load BIOS Defaults
Security Option :Setup	F7 :Load Setup Defaults
PS/2 mouse function :Disabled	
PCI/VGA Palette Snoop :Disabled	





◆ **Virus warning**

This category flashes on screen. During and after the system boot up, any attempt to write to the boot sector or the partition table of the hard disk drive will halt the system and the following error message will appear. In the meantime, you can run an anti-virus program to locate the problem. Default value is Enabled.

Enabled	Activate automatically when the system boots up causing a warning message to appear when anything attempts to access the boot sector or hard disk partition table.
Disabled	No warning message to appear when anything attempts to access the boot sector or hard disk partition table.

◆ **CPU Internal Cache/External Cache**

These two categories speed up the memory access. However, it depends on the CPU/Chipset design. Default value is Enabled.

Enabled	Enables the cache
Disabled	Disables the cache

◆ **Boot Sequence**

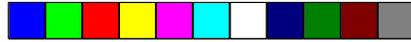
This category determines which drive the computer searches first for the disk operating system (i.e. DOS). Default value is A,C.

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**

Default value is Disabled

Enabled	Floppy A & B will be swapped under DOS
Disable	Floppy A & B will be normal definition.



◆ **Boot Up Floppy Seek**

During POST, the BIOS will determine if the floppy disk drive installed is 40 or 80 tracks. 360K type is 40 tracks while 720K, 1.2M and 1.44M are all 80 tracks. Default value is Enabled

Enabled	BIOS searches for floppy disk drive to determined if it is 40 or 80 tracks. Note that the BIOS cannot tell from 720k, 1.2M or 1.44M 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 messages if the drive installed is 360K

◆ **Boot Up NumLock Status**

Default value is On

On	Keypad is number keys
Off	Keypad is arrow keys

◆ **Memory Parity Check**

The default value is disabled

◆ **Gate A20 Option**

Gate A20 controls the ability to access memory addresses above 1 MB by enabling (Fast) or disabling (Normal) access to the processor. Default value is Fast

◆ **Typematic Rate Setting, Typematic Rate (char/sec), and Typematic Delay.**

Typematic Rate Setting enables or disables the following two options. TheTypematic Rate (6, 8, 10, 12, 15, 20, 24, or 30 characters per second) and Typematic Rate Delay (250, 500, 750, or 1000 milliseconds) controls the speed at which the keystroke is repeated. The selected character is displayed when a key is held down after a delay set by the Typematic Rate Delay. It then repeats at a rate set by the Typematic Rate.

◆ **Security Option**

This category allows you to limit access to the system setup, or just setup. 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 password is not entered at the prompt

◆ **PS/2 Mouse Function**

Enables or disables PS/2 mouse function. Default is Disabled.

◆ **PCI/VGA Palette Snooping**

The purpose of this option is to allow multiple VGA devices on different busses in a system to have data written from CPU to each set of palette registers of every video device. Default is disabled.

◆ **Video BIOS Shadow**

It determines whether Video BIOS will be copied to RAM, however, it is an optional chipset design. Default is Enabled.

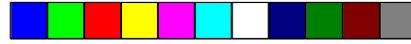
**4.7 Chipset Features Setup**

This screen controls the settings for the board's chip set. The controls for this screen are the same as the previous screen.

**The Chipset Features Screen**

ROM ISA BIOS  
CHIPSET SETUP UTILITY  
AWARD SOFTWARE, INC.

Auto Configuration	:Disabled	Memory Parity/ECC Check	:Disabled
DRAM Timing	:70ns	Single Bit Error Report	:Disabled
DRAM RAS# Precharge Time	:4	L2 Cache Cacheable Size	:64MB
DRAM R/W Leadoff Timing	:7/6	Chipset NA# Asserted	:Enabled
Fast RAS# To CAS# Delay	:3	Pipeline Cache Timing	:Faster
DRAM Read Burst Timing	:x4444		
DRAM Write Burst Timing	:x4444		
Turbo Read Leadoff	:Disabled		
DRAM Speculative Leadoff	:Disabled		
Turn-Around Insertion	:Disabled		
ISA Clock	:PCILK/4		
System BIOS Cacheable	:Enabled		
Video BIOS Cacheable	:Enabled		
8 bit I/O Recovery Time	:1		
16 bit I/O Recovery Time	:1	ESC :Quit	↑↓ → ← :Select Item
Memory Hole at 15M/16M	:Disabled	F1	:Help PU/PD/+/- :Modify
Peer Concurrency	:Enabled	F5	:Old Values (Shift)F2 :Color
Chipset Special Features	:Enabled	F6	:Load BIOS Defaults
DRAM ECC/Parity Select	:Parity	F7	:Load Setup Defaults



#### ◆ **Chipset Features**

The DRAM timings can be altered from the default to optimize system performance. Be aware though that these settings are sensitive to the type and speed of DRAMs being used and can cause lockups or data lost if set incorrectly. The default settings should work with most DRAMs.

#### ◆ **DRAM RAS# Precharge Time**

DRAM must continually be refreshed or it will lose its data. Normally, DRAM is refreshed entirely as the result of a single request. This option allows you to determine the number of CPU clocks allocated for the Row Address Strobe to accumulate its charge before the DRAM is refreshed. If insufficient time is allowed, refresh may be incomplete and data will be lost. A lower setting may increase performance.

*The default value is 4 clocks.*

#### ◆ **DRAM R/W Leadoff Timing**

This sets the number of CPU clocks allowed before reads and writes to DRAM are performed. The default of 8/7 would set the leadoff timing for reads to eight clocks and writes to seven clocks. A lower setting may increase performance.

*The default value is 8/7.*

#### ◆ **DRAM RAS to CAS Delay**

When DRAM is refreshed, both rows and columns are addressed separately. This option allows you to determine the timing of the transition from Row Address Strobe (RAS) to Column Address Strobe(CAS). A lower setting may increase performance.

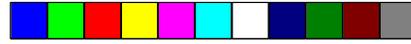
*The default is 3 cpu clock delay.*

#### ◆ **DRAM Read/Write Burst Timing**

This sets the timing for Burst mode reads from DRAM. Burst read and write requests are generated by the CPU in four separate parts. The "x" is the leadoff cycle and is determined by the chipset and the memory timing. The remaining four numbers is the actual data cycles. The lower the timing numbers, the faster the system will address memory.

*The default for read burst timing is x4444.*

*The default for write burst timing is x4444.*



#### ◆ **Speculative Leadoff**

The 430HX chipset is capable of allowing a DRAM read request to be generated slightly before the address has been fully decoded. This can reduce all read latencies.

More simply, the CPU will issue a read request and included with this request is the place(address) in memory where the desired data is to be found. This request is received by the DRAM controller. When enabled, the controller will issue the read command slightly before it has finished determining the address.

*The default is disabled.*

#### ◆ **Turn-Around Insertion**

When this is enabled, the chipset will insert one extra clock to the turn-around of back to back DRAM cycles.

*The default is disabled.*

#### ◆ **System BIOS Cacheable**

When enabled, accesses to the system BIOS ROM addressed at F0000H-FFFFFH are cached. Enable this for best performance under DOS/Windows or Windows95. When using operating systems that do not access the BIOS (Unix, OS/2, NT, etc...) this setting can be disabled.

*The default is enabled.*

#### ◆ **Video BIOS Cacheable**

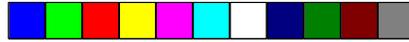
As with caching the system BIOS above, enabling the Video BIOS cache will cause access to the video BIOS addressed at C0000h to C7FFFFh to be cached.

*The default is enabled.*

#### ◆ **8/16 bit I/O Recovery Time**

The recovery time is the length of time measured in CPU clocks, which the system will delay after the completion of an I/O request. This delay takes place because the CPU is operating so much faster than the I/O bus that the CPU must be delayed to allow for the completion of the I/O request. This option allows you to determine the recovery time allowed for 8/16 bit I/O.

*The default is 1 clock cycle.*



◆ **Memory Hole at 15M-16M**

Some ISA cards may not function correctly when more than 16MB of RAM is installed. If this is the case, then enable this option. Most ISA card should work fine with this option disabled.

*The default is disabled.*

◆ **IDE HDD Block Mode**

This option allows the hard disk controller to use fast block mode transfer to and from the hard disk drive. The hard drive must support block mode transfer for this option to be enabled.(Most new drives do.)

If you are not sure if your drive supports this, call your hard drive vendor. *The default is enabled.*

◆ **IDE 32-bit Transfer Mode**

Enabling 32-bit transfer mode allows faster access to data on your hard disk drive. Not all drives will support this feature.

*The default is enabled.*

◆ **IDE Primary/Secondary Master/Slave PIO**

Rather than have the BIOS issue a series of commands to effect a transfer to or from the disk drive, PIO(Programmed Input/Output) allows the BIOS to tell the controller what it wants and lets the controller and the CPU perform the complete task themselves. This method is simpler, more efficeint and faster. This BIOS supports five modes (0 thru 4) and can be set by the user or set to Auto detect.

*The default is Auto.*

◆ **On-Chip Primary/Secondary PCI IDE**

This option enables or disables the on board PCI IDE controllers.

*The default is enabled.*

◆ **PCI Slot IDE 2nd Channel**

This option allows you to designate an IDE controller board inserted into one of the physical PCI slots as a secondary IDE controller. If you don't have a third party PCI IDE controller installed, this option should be disabled.

*The default is disabled.*



◆ **Peer Concurrency**

When enabled, multiple PCI devices can be active at any one time.  
When disabled, only one PCI device can have access to the PCI bus.  
at any one time. *The default is Enabled.*

◆ **Chipset Special Features**

When disabled, the chipset behaves as if it were the earlier 430FX  
chipset. This option should be enabled for best performance.  
*The default is Enabled.*

◆ **DRAM ECC/Parity Select**

This item allows you to select between two methods of DRAM error  
checking, ECC or Parity. Must have parity SIMMs to select ECC or  
Parity. The ECC algorithm is built into the chipset and can correct  
one bit errors. *The default is Parity.*



## 4.7.1 Power Management Setup

ROM ISA BIOS  
POWER MANAGEMENT SETUP  
AWARD SOFTWARE, INC

Power Management	:Disabled	IRQ3 (Com2)	:Off
PM Control By APM	:No	IRQ4 (Com1)	:Off
Video Off Method	:Blank Screen	IRQ5 (LPT2)	:Off
Doze Mode	:Disabled	IRQ6 (Floppy Disk)	:Off
Standby Mode	:Disabled	IRQ7 (LPT1)	:Off
Suspend Mode	:Disabled	IRQ8 (RTC Timer)	:Off
HDD Power Down	:Disabled	IRQ9 (IRQ2 Redir)	:Off
IRQ3 (Wake-Up Event)	:Off	IRQ10 (Reserved)	:Off
IRQ4 (Wake-Up Event)	:Off	IRQ11 (Reserved)	:Off
IRQ8 (Wake-Up Event)	:Off	IRQ12 (PS/2 Mouse)	:Off
IRQ12 (Wake-Up Event)	:Off	IRQ13 (Coprocesor)	:Off
		IRQ14 (Hard Disk)	:Off
		IRQ15 (Reserved)	:Off

### ◆ Power Management

Options are disabled, user defined, Min saving, and Max saving.

### ◆ PM Control by APM(Advanced Power Management)

Options are "Yes" and "No". When set for "No", system BIOS will ignore APM when power managing the system. If set on "Yes" the system BIOS will wait for APM's prompt before it enters any PM mode, e.g. Doze, Standby or Suspend.

### ◆ Video Off Method

The "Blank Screen" option will let the system BIOS blanks the screen when disabling video. V/H SYNC+Blank will let the BIOS turn off the V-SYNC and H-SYNC signals from the VGA card to the monitor.



◆ **Doze Mode**

Defines the continuous idle time before the system enters Doze mode.

◆ **Standby Mode**

Defines the continuous idle time before the system enters Standby mode.

◆ **Power Down Activities**

Defines the activities that can cause the PM timers to reload. (Breaking out of PM Mode)



## 4.8 PCI Slot Configuration

ROM ISA BIOS  
PCI/PnP Configuration  
AWARD SOFTWARE, INC.

Resource Controlled by	:Manual	PCI IRQ Activated by	:Level
Reset Configuration	:Disabled	PCI IDE IRQ Map to	:PCI-Auto
IRQ3 assigned to	:legacy ISA	Primary IDE INT#	:A
IRQ4 assigned to	:legacy ISA	Secondary IDE INT#	:B
IRQ5 assigned to	:PCI/PnP		
IRQ7 assigned to	:legacy ISA		
IRQ9 assigned to	:PCI/PnP		
IRQ10 assigned to	:PCI/PnP		
IRQ11 assigned to	:PCI/PnP		
IRQ12 assigned to	:PCI/PnP		
IRQ14 assigned to	:legacy ISA		
IRQ15 assigned to	:legacy ISA		
DMA0 assigned to	:PCI/PnP		
DMA1 assigned to	:PCI/PnP		
DMA3 assigned to	:PCI/PnP		
DMA5 assigned to	:PCI/PnP		
DMA6 assigned to	:PCI/PnP		
DMA7 assigned to	:PCI/PnP		
		ESC: Quit	
		:Select Item	
		F1 : Help PU/PD/+/-	:Modify
		F5 : Old Values (Shift)F2	:Color
		F6 : Load BIOS Defaults	
		F7 : Load Setup Defaults	

- ◆ PCI Slot 1/Slot 2/Slot 3/Slot 4/Slot 5 INT#
  - ◆ For Default Setting.

Connect to PCI System INT#	
PCI Slot1 INTA	INTA
PCI Slot1 INTB	INTB
PCI Slot1 INTC	INTC
PCI Slot1 INTD	INTD
PCI Slot2 INTA	INTB
PCI Slot2 INTB	INTC
PCI Slot2 INTC	INTD
PCI Slot2 INTD	INTA
PCI Slot3 INTA	INTC
PCI Slot3 INTB	INTD
PCI Slot3 INTC	INTA
PCI Slot3 INTD	INTB
PCI Slot4 INTA	INTD
PCI Slot4 INTB	INTA
PCI Slot4 INTC	INTB
PCI Slot4 INTD	INTC
PCI Slot5 INTA	INTA
PCI Slot5 INTB	INTB
PCI Slot5 INTC	INTC
PCI Slot5 INTD	INTD



◆ **Resources Controlled By**

The Award Plug and Play BIOS can automatically configure all the boot and Plug and Play compatible devices. If you select Auto, all the interrupt request and DMA assignment fields disappear, as the BIOS automatically assigns them.

◆ **IRQ n assigned to**

When resources are controlled manually, assign each system interrupt as one of the following types, depending on the type of device using the interrupt.

**Legacy ISA**

Devices compliant with the original PC AT bus specification.

**PCI/ISA PnP**

Devices compliant with the Plug and Play standard, whether designed for the PCI or ISA bus architecture.

◆ **PCI IRQ Activated By:**

Select the PCI IRQ Active scheme either LEVEL or EDGE.

*Default value is LEVEL.*

◆ **PCI IDE IRQ Map To:**

Select the IDE IRQ Map to ISA IRQ#.

◆ **Primary IDE INT#**

Select the PCI INT# that the Primary IDE controller will use.

*Default value is A.*

◆ **Secondary IDE INT#**

Select the PCI INT# that the Secondary IDE controller will use.

*Default value is B*



## 4.9 Integrated Peripherals

Integrated Peripherals Award Software, Inc.	
IDE HDD Block Mode	:Enabled
IDE Primary Master PIO	:Auto (See page 43 for IDE settings)
IDE Primary Slave PIO	:Auto
IDE Secondary Master PIO	:Auto
IDE Secondary Slave PIO	:Auto
On-Chip Primary PCI-IDE	:Enable
On-Chip Secondary PCI-IDE	:Enable
PCI Slot IDE 2nd Channel	:Enable
On-Board FDC Controller	:Enable
On-Board Serial Port 1	:Com1/3F8
On-Board Serial Port 2	:Com2/2F8
On-Board Parallel Port	:378/IRQ7
Parallel Port Mode	:Normal

### ◆ Onboard FDC Controller

This option lets you enable or disable the onboard floppy controller.

*The default is enabled.*

### ◆ Onboard Serial Port 1/2

This option lets you select how this port will be addressed. The options are Com1 thru Com4 or disabled.

*The default is Com1 for port 1 and Com2 for port 2.*

### ◆ Onboard Parallel Port

This option lets you select the LPT port address. Options are 3BC/IRQ7, 378/IRQ7, 278/IRQ5 or Disabled.

Note: Cannot use EPP or ECP+EPP when using 3BC/IRQ7

*The default is 378/IRQ7.*

### ◆ Parallel Port Mode

This option lets you select which mode the parallel port will run in. The options are Normal, EPP, ECP, or ECP + EPP.

Normal- Standard parallel port mode.

EPP - Bi-directional mode.

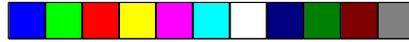
ECP - Fast, buffered mode.

EPP/ECP- Bi-directional and buffered.

Check the documentation of your device to see how it needs to be set.

*The default is Normal.*





ROM ISA BIOS  
 CMOS SETUP UTILITY  
 AWARD SOFTWARE, INC.

STANDARD CMOS SETUP	PASSWORD SETTING
BIOS FEATURES SETUP	IDE HDD AUTO DETECTION
CHIPSET FE	SETUP
PCISLOT CC	UT SAVING
LOAD SETUP DEFAULTS	
<div style="border: 1px solid black; background-color: #cccccc; padding: 5px; display: inline-block;">Enter Password</div>	
ESC : Save & Exit Setup F10 : Quit	↑ ↓ → ← :Select Item (Shift)F2 :Change Color
Change/Set/Disable 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 just press <Esc> to abort the selection and not enter a password.

To disable the password, just press <Enter> when you are prompted to enter a password. A message will confirm that the password has been 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.

#### 4.12. IDE HDD AUTO DETECTION

ROM ISA BIOS  
CMOS SETUP UTILITY  
AWARD SOFTWARE, INC.

		CYLS.	HEAD	PRECOMP	LANZONE	SECTORS
Drive C:	(202 Mb)	989	12	65535	989	35

Do you want to accept this as drive C (Y/N)?

Esc:Skip

Type "Y" to accept the H.D.D parameter reported by BIOS. Type "N" to keep the old H.D.D parameter info.

#### 4.13. SAVE & EXIT SETUP

ROM ISA BIOS  
CMOS SETUP UTILITY  
AWARD SOFTWARE, INC.

STANDARD CMOS SETUP	PASSWORD SETTING
BIOS FEATURES SETUP	IDE HDD AUTO DETECTION
CHIPSET FEATURES SETUP	LOAD BIOS DEFAULTS
PCISLOT CONFIGURATION	LOAD SETUP DEFAULTS
LOAD SETUP DEFAULTS	LOAD SETUP DEFAULTS

Save to CMOS and EXIT (Y/N)? N

ESC : Save & Exit Setup  
F10 : Quit

↑ ↓ → ← : Select Item  
(Shift)F2 : Change Color

Time, Date, Hard Disk Type,.....



Type "Y" and you will quit the Setup Utility and save the user setup values to RTC CMOS SRAM. Type "N" to return to Setup Utility.

#### **4.14 KEYBOARD SETTING FUNCTION**

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

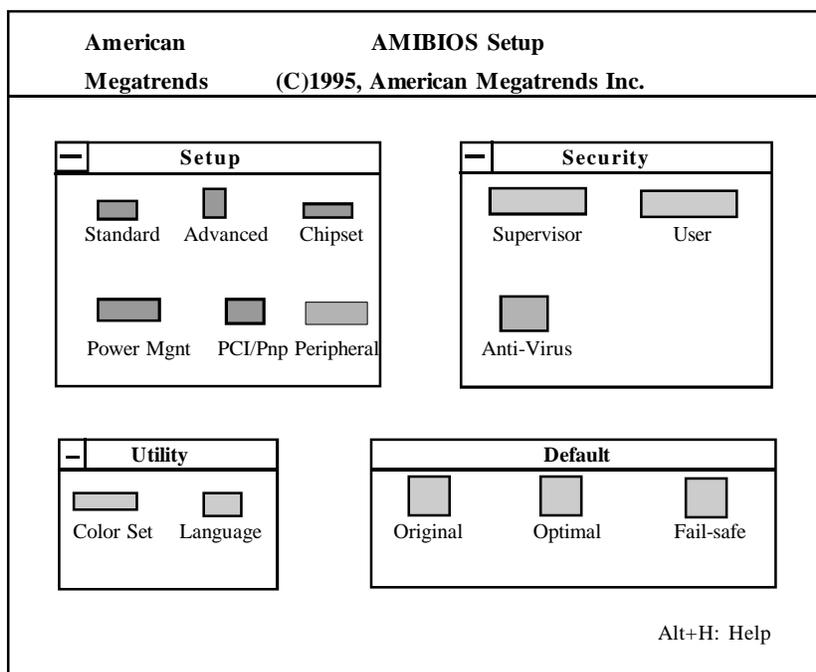
"CTRL\_ALT\_DEL" -Pressing these keys simultaneously will cause the system to WARM START/BOOT(Soft Reset).



## 5.0 AMI WINBIOS

The AMI WINBIOS is based on a Graphical User Interface that enables the user to access all of the BIOS setup options with either a mouse or keyboard. You can enter the BIOS setup by pressing the "DEL" key during the memory test/count.

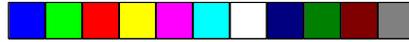
The WINBIOS Setup screen consists of the following option groups:



## 5.1 Standard Setup Options

### Date, Day and Time Configuration

Select the Standard Option, then select the Date and Time Icon. The current values for each category are displayed. Use the arrow keys or mouse to highlight the date or time fields. Use the + or - keys to change the field values. The system will automatically select the appropriate day of the week.



◆ **Primary/Secondary Master**

◆ **Primary/Secondary Slave**

Select one of these hard disk drive icons to configure the drive named in the option. WINBIOS supports up to four IDE hard disk drives: the primary master, primary slave, secondary master and secondary slave. If the hard disk drive is an IDE drive, select DETECT PRIMARY or DETECT SLAVE from the Utility Setup Option Section of the WINBIOS Setup Main Menu to have WINBIOS automatically detect the IDE drive parameters and report them to this screen. The SCSI option or none must be selected if a SCSI Disk Drive is installed. For CD-ROM drives you should use none.

You can also manually enter the hard disk drive parameters. Hard disk type 47 is the user-definable drive type. The drive parameters are: Type, Cylinders, Heads, Write precompensation, Landing Zone, Sectors and Capacity.

◆ **Floppy Drive A:**

◆ **Floppy Drive B:**

Move the cursor to these fields via the up and down arrow keys and select the floppy type. The settings are 360 KB 5 1/4 inch, 1.2MB 5 1/4 inch, 720MB 3 1/2 inch, 1.44MB 3 1/2 inch and 2.88MB 3 1/2 inch..

## 5.2 Advanced Setup

The WINBIOS Setup options described in this section are selected by choosing the Advanced Setup Icon from the WINBIOS Setup Main Menu.

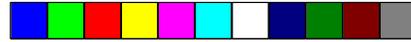
◆ **Quick Boot**

When enabled the BIOS will skip the memory test and will not access the floppy drive during POST. When enabled the BIOS does a memory test and will access and verify floppy drive types.

*The default is Enabled.*

◆ **BootUp Sequence**

This option let the user specify in what sequence the BIOS will look for a boot device. Options are A:C:, CDROM, C:A:, CDROM or CDROM, C:A:. *The default is C:A:, CDROM.*



◆ **BootUp Num-Lock**

This option gives the user the option to turn on or off the num-lock on **boot-up**. *The default is On.*

◆ **Floppy Drive Swap**

When *enabled*, the system allows the floppy drives to swap drive letters with each other. *The default is disabled.*

◆ **Mouse Support**

*Enable or disable* the onboard PS/2 support..  
*The default is enabled.*

◆ **Primary Display**

This option detects the primary graphics display system.  
*The default is VGA/EGA.*

◆ **Password Check**

This option enables the password check option everytime the system boots or the user runs WinBIOS setup. If *Always* is chosen, a user password prompt appears everytime the computer is powered on. If *Setup* is chosen, the passwrd prompt appears if WinBIOS setup is executed. *The default is Setup.*

◆ **OS/2 Compatible Mode**

This option lets you turn on or off the BIOS support for OS/2.  
*The default is disabled.*

◆ **Internal Cache**

This option lets the user enable or disable the Pentiums level 1 cache. When this option is set for *WriteBack* the CPUs level 1 cache is enabled. When this option is set for *Disabled*, the CPU will not use its internal cache. *The default is WriteBack.*

◆ **External Cache**

This option lets the user enable or disable the mainboards level 2 cache.  
*The default is Enabled.*



◆ **System BIOS Cacheable**

If this option is *enabled*, the F000 segment of the BIOS shadow will be cached. *The default is enabled.*

◆ **Adaptor ROM Shadow C000 to DC00**

The adaptor ROMs present on the system may either execute out of ROM(*disabled*), RAM(*Shadow*), or execute out of RAM and be cached(*Cache*). The adaptor ROM area should be left *disabled* unless the device in that region can support shadowing (Its ROM being copied to RAM for better performance). *The default is disabled.*





### 5.3 Advanced Chipset

#### ◆Global 430HX Enable

This option provides a method to enable or disable all of the additional features provided by the 430HX chipset(enhancements to 430FX).

#### ◆Shutdown to Port 92

When disabled, the 430HX forwards a Shutdown special cycle from the host bus to the PCI bus. When enabled, the TXC will write a 1 to I/O address 92 in response to a shutdown special cycle on the host bus.  
*The default is disabled.*

#### ◆Memory Hole

This option lets you create a memory hole for either the 512-640KB region or the 15-16MB region. *The default is disabled.*

#### ◆IRQ12/M Mouse Function

Enables or disables PS/2 mouse access to IRQ12.  
*The default is enabled.*



#### ◆8 bit I/O Recovery Time

##### 16 bit I/O Recovery Time

These options set the 8 bit and 16 bit I/O recovery time in the chipset. I/O devices may not function correctly if two back to back I/O writes occur too close together. These options increase the delay between back to back I/O instructions.

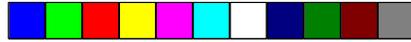
The options for 8 bit are 1,2,3,4,5,6,7,8 Sysclk or Disabled.

The options for 16 bit are 1,2,3,4 Sysclk or Disabled.

*The default for both options is 1 Sysclk.*

#### ◆DRAM Timing

This setup question allows the system to be set to either optimal settings for 60ns or 70ns DRAM, or to be set to manual. In this mode the next nine options are made available for customizing the memory timing.



◆ **Refresh Rate**

Allows the refresh rate to be set according to the memory bus clock (50mhz, 60mhz or 66mhz). *The default depends on CPU speed.*

◆ **Turbo Read LeadOff**

A feature to enable the skipping of the first input register in the DRAM data pipeline. This results in a 1 HCLK savings of all READ leadoff timings.

◆ **Read/Write Burst Timing**

Allows customizing of the read timings in the memory design. The options are x2222, x3333 and x4444. The lower the number, the faster the DRAM will be accessed.

◆ **Fast RAS to CAS Delay (Clocks)**

If enabled, the row miss leadoff timing delay is set to 2 clocks, otherwise it is set to 3 clocks. *The default is 7/6/3/4.*

◆ **LeadOff Timing**

This bit controls additional DRAM timings. This includes: Read LeadOff, Write LeadOff, RAS# Precharge, and Refresh RAS assertion.

◆ **Turbo Read Pipelining**

This bit affects the Read timings.  
*The options are enabled or disabled. The default is disabled.*

◆ **Speculative LeadOff**

In this mode the DRAM controller read request is presented before the final memory target (main memory, cache, or PCI) is decoded. This results in a 1 HCLK increase in DRAM read leadoff latencies.  
*The default is disabled.*

◆ **Turn-Around Insertion**

When enabled the chipset inserts 1 extra clock of turnaround on the MD lines after asserting memory write enable (MWE#).



◆ **Memory Address Drive Strength**

This setup option allows the selection of memory address output buffer drive affecting the MA(memory address) and MWE#(memory write enable) pins. *The default is 8ma/8ma.*

◆ **NA Disable (NAD) For External Cache**

When enabled the NA#(next address) pin is never asserted, otherwise the assertion is dependent upon the cache type and size. *The default is enabled.*

◆ **Peer Concurrency**

When enabled the CPU will be allowed to run DRAM/L2 cycles when non-PHLD(PCI masters are running non-locked cycles targeting PCI peer devices). *The default is enabled.*

◆ **ECC Test**

This is a test mode described in the 430HX( Xcellerated Controller) external design specification. This should be enabled only when using ECC memory. *The default is disabled.*

◆ **DRAM Data Integrity Mode**

This option allows the selection of the DRAM error detection. Either parity or ECC modes are supported. *The default is parity.*

◆ **SERR# (System Error)Output Type**

This allows the selection of the output type of the SERR# signal. Valid options are Open drain and Normal (actively driven high). *The default is normal.*

◆ **SERR#(System Error) Duration Mode**

This option allows the determination of the SERR# output's duration when it is asserted. The modes are Pulse (asserted for 1PCLK), or Level (asserted until the error flags are cleared). *The default is Pulse.*

◆ **SERR# (System Error)Enable**

This is the master enable bit for SERR# generation. *The default is disabled.*





◆ **SingleBit Correctable Error**

This option if enabled will assert SERR# upon the detection of a single bit error (SBE). *The default is disabled.*

◆ **MultiBit Uncorrectable Error**

This option if enabled will assert SERR# upon the detection of a multi bit error (MBE) or parity error. *The default is disabled.*

◆ **Bad Parity On Uncorrectable Error**

The TXC forces bad parity on PCI read data starting from the time an uncorrectable DRAM error is detected, until the end of the current cycle. *The default is disabled.*

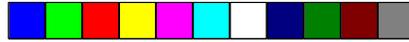
◆ **PCI 2.1 Passive Release Enable**

If enabled, this option causes the PIIX3 to use the passive release mechanism on the PHOLD# signal. If disabled the PHOLD# signal behaves as it did previously with the Triton I chipset. *The default is enabled.*

◆ **Delayed Transaction Enable**

If enabled the delayed transaction mechanism is used when the PIIX3 is the target of a PCI transaction. *The default is enabled.*





## 5.4 Power Management

### ◆ Advanced Power Management

This option *enables* or *disables* power management.  
*The default is disabled.*

### ◆ Standby to Suspend Timeout Value

This option indicates the time before standby and suspend power saving modes will occur. The options are from *disabled* thru *255 minutes*.  
*The default is disabled.*

### ◆ IDE Drive Power Down In

This option specifies which mode the IDE drives will power down in. The options are *disabled*, *standby* or *suspend*.  
*The default is disabled.*

### ◆ VESA Video Power Down In

This option specifies which mode the video will power down in. The options are *disabled*, *standby* or *suspend*.  
*The default is disabled.*

### ◆ VESA Power Down In

This option specifies the power saving mode for the video. The options are *standby*, *suspend* or *off*.  
*The default is standby.*

### ◆ Slow Clock Ratio

This ratio indicates the amount the CPU will be slowed when the CPU enters standby mode.  
*The default is 1:1.*

### ◆ IRQ x Break Event (x= 0 to 15)

These break events indicate which IRQ events will wake up the system and/or reload the standby and suspend timers. The options are *disabled* and *enabled*.  
*The default is disabled.*



## 5.5 Peripheral

### ◆ Programming Mode

When set to manual, you can customize all the settings below.

When set to auto, they system will automatically configure all the ports.

*The default is Manual.*

### ◆ OnBoard FDC

This option lets you enable or disable the onboard floppy disk controller.

*The default is enabled.*

### ◆ Serial Port 1

This option lets you configure the address of serial port 1. The options are 3F8h, 3E8h, 2E8h or disabled.

*The default is 3F8h.*

### ◆ Serial Port 2

This option lets you configure the address of serial port 2. The options are 2F8h, 3E8h, 2E8h and disabled.

*The default is 2F8h.*

### ◆ Parallel Port

This option lets you configure the address of the onboard parallel port. The options are 3BCh, 378h, 278h or disabled.

*The default is 378h.*

### ◆ Parallel Port Mode

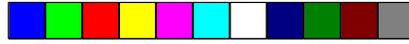
This option lets you configure the mode that the onboard parallel port will function in. The options are Extended or Normal.

*The default is Extended.*

### ◆ IRQ Active

This options lets you set the IRQ trigger. The options are High or Low. The default should be used in most cases.

*The default is High.*



## 5.6 Utility

### **Detect Master/Detect Slave**

These options, when invoked will enable the CMOS to query the IDE drive firmware for its cylinder, head and sector parameters.

### **Color Set**

This option lets you select the color scheme of the WinBIOS setup screen. The options are *LCD*, *Army*, *Pastel* and *Sky*.

The default is *LCD* (Very boring).

## 5.7 Security

### **Password**

The password feature prohibits unauthorized changes to the system setup accessed via the CMOS setup program. The default password is "AMI".

### **Anti-Virus**

If enabled, this option will protect the boot sector of the hard disk drive.

Nothing can be written to the boot sector while this option is enabled.

This option should be disabled if you are installing a new operating system that writes to the boot sector. The default is *disabled*.

## 5.8 Defaults

### **Original**

This option restores the CMOS setup to factory default settings.

### **Optimal**

This option will configure the CMOS setup to its fastest settings.

### **Fail-Safe**

This option will configure the CMOS setup to its most conservative settings.

### **CMOS Save & Exit**

To save the changes made to the CMOS setup, press the ESCape key until the "exit CMOS" menu appears, then select your choice.



## 6.0 Flash Writer Utility

You can upgrade the BIOS of your mainboard by using a "Flash Memory Writer"(FMW) utility. This utility can be downloaded from the factory's BBS(Consult your system vendor for the phone #). The system BIOS is stored on a 'flash' EPROM chip on the mainboard which can be erased and reprogrammed by the FMW.

The following three files make up the FMW.

AWDFLASH.EXE	-The Flash Memory Writer utility for Award to Award upgrade.
AMIFLASH.COM	-The Flash Memory Writer utility for AMI to AMI upgrade.
README	-A text file of instructions
*S56AWXX.BIN	-XX-A 2-digit version number.

Flash memory writer records (or 'programs') a new BIOS onto the flash memory chip. You cannot upgrade an Award BIOS to a AMI BIOS or a AMI BIOS to an Award BIOS.

\*This file name is subject to change and can have either a "bin" or a "rom" extension.





To reprogram the System BIOS, you must first do the following:

1. Check jumpers J48

The S1564 uses a 5V Flash EPROM so jumper J48 should be left in the default position on pins 1 and 2. This jumpers should never be moved.

2. Make sure the CPU is running in 'real mode'.

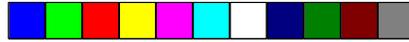
FMW will not run if the CPU is operating in a protected or virtual mode. This means that you can not run it with Windows running or with any memory manager software. You must disable any memory manager first. The easiest way to do this is to:

- a. Boot your system from a bootable floppy disk with no CONFIG.SYS or AUTOEXEC.BAT files, and then run Flash Memory Writer from a backup copy of your support disk. You can make your back-up floppy bootable when you format it, and use one disk for both purposes.

- b. If you are using MS-DOS 6.x, you can use the feature that allows you to bypass the CONFIG.SYS and AUTOEXEC.BAT file. You do this while pressing <F5> while the "Starting MS-DOS..." line is on the screen.

There are other ways to accomplish the same result. The main point is to make sure no memory managers are running. If you are not sure, try running FMW. If it runs, then you have succeeded. If it displays a warning message about the CPU mode, you will have to try again.





Once you have satisfied the two requirements mentioned above, you can run FMW. You can copy the contents of the “Flash” directory to your hard drive, or you can run the utility from a backup of the support floppy disk. Make sure the new BIOS file is in the same directory as the FMW utility.

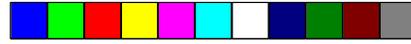
To run FMW, change to the “Flash” directory if you are not already in it. Type “Awdflash” at the DOS command line and press the <Enter> key. The following screen will appear.

### 6.1 The Flash Memory Writer Utility Screen (Award)

FLASH MEMORY WRITER V3.0 Copyright (C) 1993, AWARD Software Inc.,	
For FX/HX-2A59CT51	Date:4/13/95
File Name to Program:	
Error Message:	

Type in the whole file name, e.g. S56AW10.BIN and confirm that you want to program the BIOS. The utility will then ‘Blank’, ‘Erase’, and then ‘Program’ the flash memory on the mainboard with the new BIOS file. You should choose “yes” to save the original system BIOS to a floppy diskette before you program the new BIOS. This leaves you with a backup of your original BIOS in case you need to re-install it. This option is highly recommended. If you can not successfully program the BIOS file for whatever reason, re-install you original BIOS from the backup file.

**Warning:** If you do not successfully install a complete BIOS file in the flash memory on the Mainboard, your system may not be able to boot. If this happens, it will require service by your system vendor. Follow the requirements and instructions in this section precisely to avoid inconvenience.



## 7.0 TIMER & DMA CHANNEL MAP

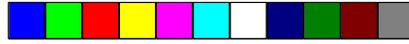
TIMER MAP:           TIMER Channel-0 system timer interrupt  
 TIMER Channel-1 DRAM REFRESH request  
 TIMER Channel-2 SPEAKER tone generator

DMA CHANNELS:    DMA Channel-0 Available  
 DMA Channel-1 Available  
 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

## 7.1 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 9-15  
 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 Available  
 13 MATH co-processor  
 14 HARD DISK controller  
 15 HARD DISK controller



**Tyan Computer S1564**



**Tested To Comply  
With FCC Standards**

**FOR HOME OR OFFICE USE**

**Notice for the USA  
Compliance Information Statement  
(Declaration of Conformity Procedure) DoC**

FCC Part 15: This Device complies with Part 15 of the FCC Rules.

Operation is subject to the following conditions:

- 1) this device may not cause harmful interference, and
- 2) this device must accept any interference received including interference that may cause undesired operation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try one or more of the following measures:

- ◆ Reorient or relocate the receiving antenna.
- ◆ Increase the separation between the equipment and receiver.
- ◆ Connect the equipment into an outlet on a circuit different from that of the receiver connected.
- ◆ Consult the dealer or an experienced radio/TV technician for help.

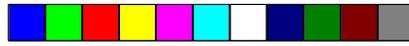
**Notice for Canada**

This apparatus complies with the Class "B" limits for radio interference as specified in the Canadian Department of Communications Radio Interference Regulations.

Cet appareil est conforme aux normes de CLASSE "B" d'interference radio tel que spec'ifiee par le Ministere Canadien des Communications dans les reglements d'interference radio.

**Notice for Europe (CE Mark)**

This product is in conformity to the Council Directive 89/336/EEC, 92/31/EEC (EMC)



## **Appendix: LM78 System Hardware Monitor and LANdesk Client Manager (LDCM)**

**NOTICE:** If you purchased a S1564 without a LM78 monitoring chip installed (it is a manufacturing option) , you can skip this section.

To enhance the performance of your computer system, Tyan has incorporated National Semiconductor's LM78 Microprocessor System Hardware Monitor and LANdesk Client Manager (LDCM) into the S1564 board design. The LM78 is an Integrated Data Acquisition system, designed to monitor power supply voltages, temperatures, and fan speeds.

To achieve this purpose, the LM78, a hardware monitor component, has an on-chip temperature sensor, 5 positive analog inputs, two inverting inputs and an 8-bit ADC. In addition, the LM78 also provides ISA and Serial Bus Interfaces. A 32-byte auto-increment RAM is provided for POST (Power On Self Test) code storage.

### **Features**

The LM78 includes the following features:

- Temperature sensing
- 5 positive voltage inputs
- 2 op amps for negative voltage monitoring
- 3 fan speed monitoring inputs
- Input for additional temperature sensors
- Chassis Intrusion Detector Input

The software program-- LDCM (LANdesk Client Manager) is used as the LM78's drivers to accomplish monitoring computers' temperatures and voltages. The LDCM Drivers use the LM78 to monitor critical hardware components and enable remote sensing and diagnostics of the system Board. Thus, by implementing both National Semiconductor's LM78 and LDCM in the S1564 system, Tyan provides you with the best quality board possible on the market.

**For more information, please refer to Tyan's Web Page:**

**[Http://www.tyan.com](http://www.tyan.com)**



## Addendum for S1564S/D

The 1564S/D Motherboard User's Manual, Revision 1.0, does not contain the CPU jumper settings for Cyrix 6x86MX processors. The following chart should be used for setting the jumpers for that CPU series.

Note that only processors with BUS speeds of 50, 60, and 66MHz are supported by the 1564S/D boards. Thus, the following Cyrix 6x86MX/ IBM M2/SGS CPUs should not be used unless the BUS speed and multiplier are adjusted.

CPU Model	Default BUS speed & multiplier (WILL NOT WORK)	Default Physical Speed	Adjusted BUS speed & multiplier (WILL WORK)	Adjusted Physical Speed
Cyrix PR200+ 6x86MX (IBM M2 PR200+) (SGS PR200+)	75MHz x 2	150MHz	50MHz x 3	150MHz
Cyrix PR233+ 6x86MX* (IBM M2 PR233+) (SGS PR233+)	75MHz x 2.5	188MHz	50MHz x 4	200MHz

\*due to CPU unavailability, the 50MHz x 4 setting has not been tested.

The PR 200+ and PR 233+ processors come in both 66MHz and 75MHz versions. Check your CPU to see which type you have before setting the jumpers.

### CPU Jumper Settings

CPU Model	Cyrix PR 166+ 6x86MX	Cyrix PR 166+ 6x86MX	Cyrix PR 200+ 6x86MX	Cyrix PR 233+ 6x86MX
BUS speed & multiplier	60MHz x 2.5	66MHz x 2	66MHz x 2.5	66MHz x 3
VD0	ON	ON	ON	ON
VD1	OFF	OFF	OFF	OFF
VD2	OFF	OFF	OFF	OFF
VD3	ON	ON	ON	ON
VIO	ON	ON	ON	ON
J13	3-4	1-2	1-2	1-2
J19	ON	ON	ON	OFF
J20	ON	OFF	ON	ON
J21	OFF	OFF	OFF	OFF