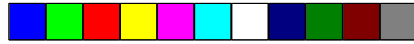


Table Of Contents

1. Introduction.....	1
1.1 Preface.....	1
1.2 Key Features.....	1
1.3 Hardware Specifications.....	2
1.4 Software Specifications.....	2
1.5 Environment.....	3
2. Board Installation.....	4
2.1 Unpacking.....	4
2.2 Installation.....	5
3. S1461/6 On Board Resource Setting.....	6
3.1 S1466 Board Layout & Jumper Location Rev 03.....	6
3.2 Quick Reference for Jumpers(S1466) Rev 03.....	7
3.3 S1466 Board Layout & Jumper Location Rev 02.....	9
3.4 Quick Reference for Jumpers(S1466) Rev 02.....	10
3.5 S1461 Board Layout & Jumper Location.....	12
3.6 Quick Reference for Jumpers(S1461).....	13
3.7 S1463 Board Layout & Jumper Location.....	15
3.8 Quick Reference for Jumpers(S1463).....	16
3.9 DRAM Installation.....	18
3.10 CPU Installation.....	19
3.11 Understanding The Different Clock Speeds.....	20
3.12 Upgrading Cache Memory.....	21
3.13 CMOS RTC.....	22
3.14 Speaker Connector Installation.....	22
3.15 Turbo Switch.....	22
3.16 Turbo LED Connector Installation.....	23
3.17 Hardware Reset Switch Connector Installation.....	23
3.18 Flash EPROM Jumpers.....	23
3.19 Hardware Password & CMOS Reset.....	23
3.20 Peripheral Device Installation.....	24
3.21 Turbo/Non-Turbo hotkeys.....	24
3.22 Connecting The Power Supply.....	25
4. BIOS Configuration.....	27
4.1 Entering Setup.....	27
4.2 Control Keys.....	28
4.3 Getting Help.....	29
4.4 The Main Menu.....	29
4.5 Standard CMOS Setup Menu.....	31
4.6 BIOS Features Setup.....	34
4.7 Chipset Features Setup.....	37
4.7.1 Power Management Setup.....	39
4.8 PCI Slot Configuration.....	41
4.9 Load Setup Defaults.....	43

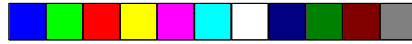


4.10 Password Setting.....	43
4.11 IDE HDD Auto Detection.....	45
4.12 Save & Exit Setup.....	45
4.13 Keyboard Setting Functions.....	46
5.AMI WinBIOS.....	47
5.1 Standard Setup Options.....	47
5.2 Advanced Setup.....	48
5.3 Advanced Chipset.....	51
5.4 Power Management.....	53
5.5 Utility.....	54
5.6 Security.....	54
5.7 Defaults.....	54
6. Flash Writer Utility.....	55
6.1 The Flash Memory Writer Utility Screen.....	57
7. AT Technical Information.....	58
7.1 I/O Bus Connector Pin Out.....	58
7.1.1 ISA Slot Pin Out.....	58
7.1.2 PCI-Bus Slot Pin Out.....	59
7.2 Timer & DMA Channel Map.....	60
7.3 Interrupt Map.....	60
7.4 RTC & CMOS Ram Map.....	61
Appendix A. Post Codes.....	62

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

Trademarks

Award BIOS/Flash are trademarks of Award Software International Inc.
 AMI BIOS is a trademarks of American Megatrends Inc.
 IBM,PC,ATPS/2 are trademarks of IBM Corporation
 INTEL,Pentium are trademarks of Intel Corporation.



1. Introduction

1.1 Preface

The S1461/3/6 is an Intel Triton chipset based Pentium PC/AT mainboard. With support for 75 thru 166MHz CPU, PCI local bus, and ISA bus, it can be used in the fastest PC/AT systems. The S1461 and S1463 use standard SRAM and the S1466 comes with synchronous pipeline burst-mode SRAM for better system performance. Both boards can support either 256KB or 512KB of cache.

1.2 Key Features

- * Pentium based PC/AT compatible mainboard with Intel Triton chipset
- * 4 Master/Slave PCI Bus slots, 4 ISA Bus slots
- * 3 Master/Slave PCI Bus slots, 5 ISA Bus slots for S1463
- * Supports Pentium Processors (75 thru 166 MHz).
- * Supports true 64 bit CACHE and DRAM access mode.
- * Supports ZIF Socket 7.
- * Supports 256/512KB 2nd level cache memory, either synchronous or standard SRAM.
- * CPU WRITE-BACK cache operation.
- * On board EIDE PCI controller.
Supports PIO Mode 0,1,2,3,4 and Bus Master mode 1,2 operations.
- * Supports up to 128 MB Fast Page Mode or EDO DRAM memory on board.
- * Support for Advanced Power Management
- * System/Video BIOS uses cachable shadow RAM to improve performance.
- * Licensed AWARD BIOS or AMI BIOS.
- * Flash BIOS support
- * Mini-Baby AT form factor, 4 layer PCB.



1.3 Hardware Specifications

- * CPU
 - 3.3V Pentium 75 thru 166 MHz CPU
 - Pentium Overdrive Processor (Socket 7)
- * Coprocessor
 - Included in Pentium CPU.
- * Speed
 - 50/60/66 MHz System Bus and 25/30/33 MHz PCI Bus speed.
 - 7.5/8.33 MHz ISA Bus speed.
 - H/W and S/W speed switchable function (Cache or non Cache).
- * DRAM Memory
 - 2 double banks of 72 pin SIMM Module DRAM.
 - 2MB to 128 MB DRAM size.
 - Supports Fast Page DRAM access mode.
 - Supports EDO (Extended Data Out) DRAMs (also known as Hyper Page mode).
- * Cache Memory
 - 16 KB cache memory included in Pentium.
 - 256/512 KB on board 2nd level cache memory.
 - Support Pentium BURST read/write mode on 2nd level cache memory access.
 - Supports either synchronous or standard SRAM.
- *EIDE Controller
 - Primary and secondary PCI EIDE channels on board for support of up to four EIDE Mode 0 through Mode 4 drives.
- * Shadow RAM
 - Main BIOS function.
 - Video BIOS shadow function programmable.
 - Shadow RAM caching function programmable.
- * I/O Bus Slots
 - 4 Master/Slave PCI-Bus.
 - 4 ISA Bus.
- * Dimensions
 - Mini-Baby AT size.

1.4 Software Specifications

- * BIOS
 - Licensed AWARD BIOS or AMI BIOS.
 - AT CMOS Setup, BIOS/CHIPSET Setup, and hard disk utility included.
- * O.S.
 - Operates with MS-DOS, Windows, Windows NT, OS/2, Novell, and SCO Unix.
- * Utilities
 - Flash EPROM utility





1.5 Environment

Ambient Temperature	0 to +50 C (operating)
Relative Humidity	0 to +85% (operating)
Altitude	0 to 10,000 feet (operating)
Vibration	0 to 1,000 Hz
Voltage	4.9 to 5.2 V





2. Board Installation

2.1 Unpacking

The mainboard package should contain the following:

- * S1461/3/6 Mainboard
- * Two IDE 40 pin cables
- * 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.

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

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

After opening the mainboard carton, extract the system board and place it only on a grounded anti-static surface, component side up. Again inspect the board for damages. 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 APPLY POWER TO THE BOARD IF IT HAS BEEN DAMAGED!





2.2 Installation

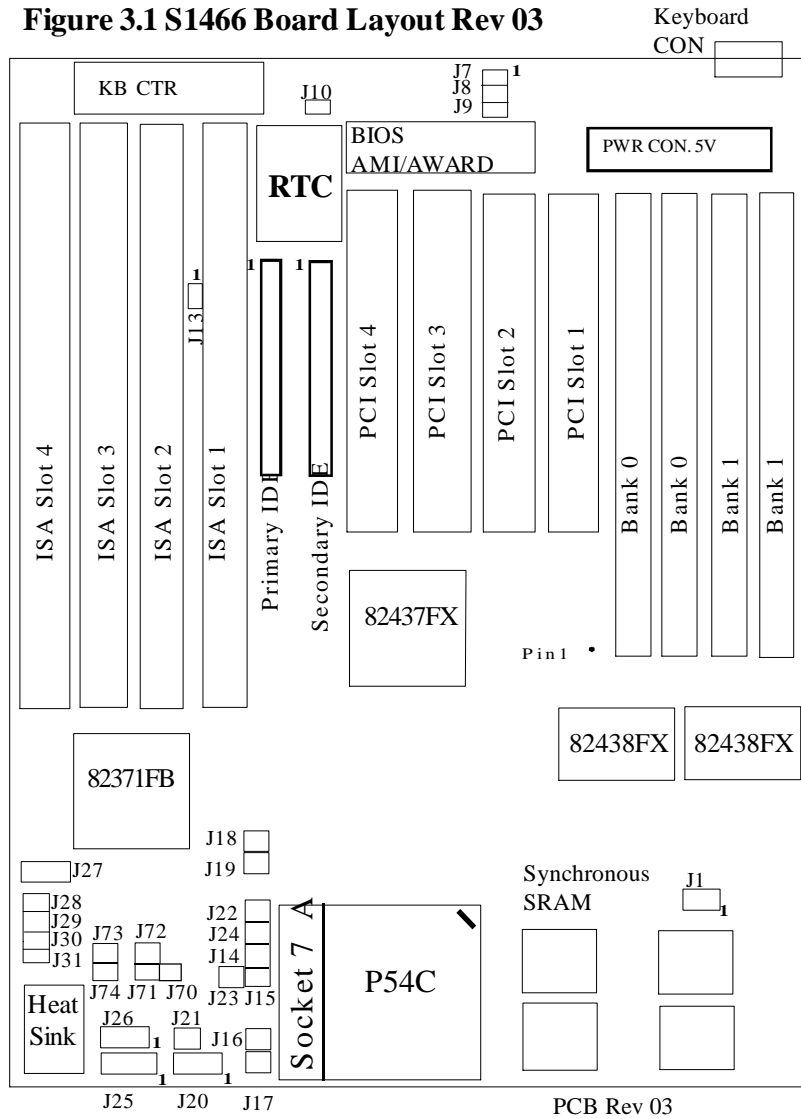
You are now ready to install your mainboard. The mounting hole pattern of the S1461/S1463/S1466 matches the IBM-AT system board spec. It is assumed that the chassis is designed for a standard IBM XT/AT mainboard.

Place the chassis on the anti-static mat and remove the cover. Remove the plastic clips, nylon stand-offs and screws for mounting the system board, and keep them separate.



3. On Board Resource Setting

Figure 3.1 S1466 Board Layout Rev 03



J18	J19	J14	J15	CPU Speed
On	On	Off	Off	75 MHz
On	Off	Off	Off	90 MHz
Off	On	Off	Off	100 MHz
On	Off	On	Off	120 MHz
Off	On	On	Off	133 MHz
On	Off	On	On	150 MHz
On	On	Off	On	150 MHz
Off	On	On	On	166 MHz

J1	J23	J22	Cache Size
2-3	On	Off	256KB
1-2	Off	On	512KB

J25: Keylock J21: Turbo LED
 J20: IDE LED J16: Turbo Switch
 J17: Reset J26: Speaker

* The following jumpers must be left at the default positions.

J30: Closed J9: 1-2 J74: Closed

J7: 1-2 J13: 2-3 J71: Closed

J8: 1-2 J73: Closed *All other jumpers are reserved.



3.2 Quick Reference For Jumpers & Connectors (S1466 rev 03) (refer Fig. 3.1)

* : 5V Power Connector

1	Power Good Signal
2,10,11,12	VCC (+5V)
3	+12V
4	-12V
5,6,7,8	GND
9	-5V

* J17: Reset Connector

"Open" for normal operation
"Closed" for hardware reset

* J1,J23,J22: L2 Cache Size Selection

Cache Size:	J1	J23	J22
256kb	2-3	On	Off
512kb	1-2	Off	On

* J25: Power LED and Keylock Connector

1	LED anode (+)
2	NC
3	LED cathode (-)
4	Keylock
5	GND

* J26: Speaker Connector

1	Data Out
2	NC
3	GND
4	+5 VDC

* J16: Turbo Switch Connector

Hardware turbo switch is not supported.
Use <Ctrl> +<Alt>+<-> for non-turbo mode.
Use <Ctrl>+<Alt>+<+> for turbo mode.





* J21: Turbo LED Connector

- 1 LED cathode (-)
- 2 LED anode (+)

* J18, J19, J15, J14: System Speed Selection

J18	J19	J14	J15	CPU Speed
Off	On	On	On	166MHz Pentium
On	Off	On	On	150MHz Pentium
On	On	Off	On	150MHz Pentium
Off	On	On	Off	133MHz Pentium
On	Off	On	Off	120MHz Pentium
Off	On	Off	Off	100MHz Pentium
On	Off	Off	Off	90MHz Pentium
On	On	Off	Off	75MHz Pentium

* J14 & J15: CPU Clock Multiplier

J14	J15	CPU Mode
Off	Off	CPU x 1.5(75,90 & 100MHz)
On	Off	CPU x 2 (120 & 133MHz)
On	On	CPU x 2.5(150 & 166MHz)
Off	On	CPU x 3 (150MHz)

* J10: Reset CMOS and clear Password

- OFF: Normal Operation
- ON: Clears Password and resets CMOS to default.

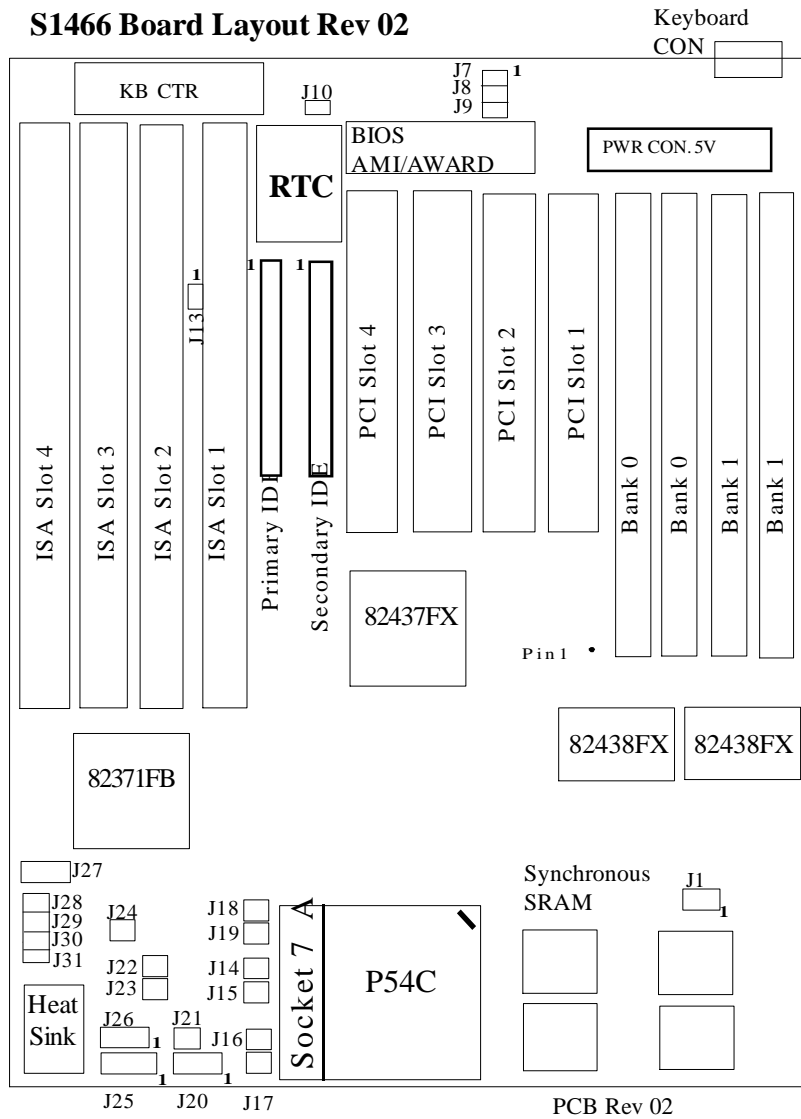
* J20: On Board IDE LED

- Used to show on board IDE drive activity.
- Only pins 1 and 2 are used.



3.3 On Board Resource Setting

S1466 Board Layout Rev 02



J18	J19	J14	J15	CPU Speed
On	On	Off	Off	75 MHz
On	Off	Off	Off	90 MHz
Off	On	Off	Off	100 MHz
On	Off	On	Off	120 MHz
Off	On	On	Off	133 MHz
On	Off	On	On	150 MHz
On	On	Off	On	150 MHz
Off	On	On	On	166 MHz

J1	J23	J22	Cache Size
2-3	On	Off	256KB
1-2	Off	On	512KB

J25: Keylock J21: Turbo LED
 J20: IDE LED J16: Turbo Switch
 J17: Reset J26: Speaker

* The following jumpers must be left at the default positions.

J30: Closed J9: 1-2

J7: 1-2 J13: 2-3

J8: 1-2

*All other jumpers are reserved.



3.4 Quick Reference For Jumpers & Connectors (S1466 rev 02)

* : 5V Power Connector

1	Power Good Signal
2,10,11,12	VCC (+5V)
3	+12V
4	-12V
5,6,7,8	GND
9	-5V

* J17: Reset Connector

"Open" for normal operation
 "Closed" for hardware reset

* J1,J23,J22: L2 Cache Size Selection

Cache Size:	J1	J23	J22
256kb	2-3	On	Off
512kb	1-2	Off	On

* J25: Power LED and Keylock Connector

1	LED anode (+)
2	NC
3	LED cathode (-)
4	Keylock
5	GND

* J26: Speaker Connector

1	Data Out
2	NC
3	GND
4	+5 VDC

* J16: Turbo Switch Connector

Hardware turbo switch is not supported.
 Use <Ctrl> +<Alt>+<-> for non-turbo mode.
 Use <Ctrl>+<Alt>+<+> for turbo mode.





* J21: Turbo LED Connector

- 1 LED cathode (-)
- 2 LED anode (+)

* J18, J19, J15, J14: System Speed Selection

J18	J19	J14	J15	CPU Speed
Off	On	On	On	166MHz Pentium
On	Off	On	On	150MHz Pentium
On	On	Off	On	150MHz Pentium
Off	On	On	Off	133MHz Pentium
On	Off	On	Off	120MHz Pentium
Off	On	Off	Off	100MHz Pentium
On	On	Off	Off	75MHz Pentium

* J14 & J15: CPU Clock Multiplier

J14	J15	CPU Mode
Off	Off	CPU x 1.5(75,90 & 100MHz)
On	Off	CPU x 2 (120 & 133MHz)
On	On	CPU x 2.5(150 & 166MHz)
Off	On	CPU x 3 (150MHz)

*J10: Rset CMOS and clear Password

OFF: Normal Operation

ON: Clears Password and resets CMOS to default.

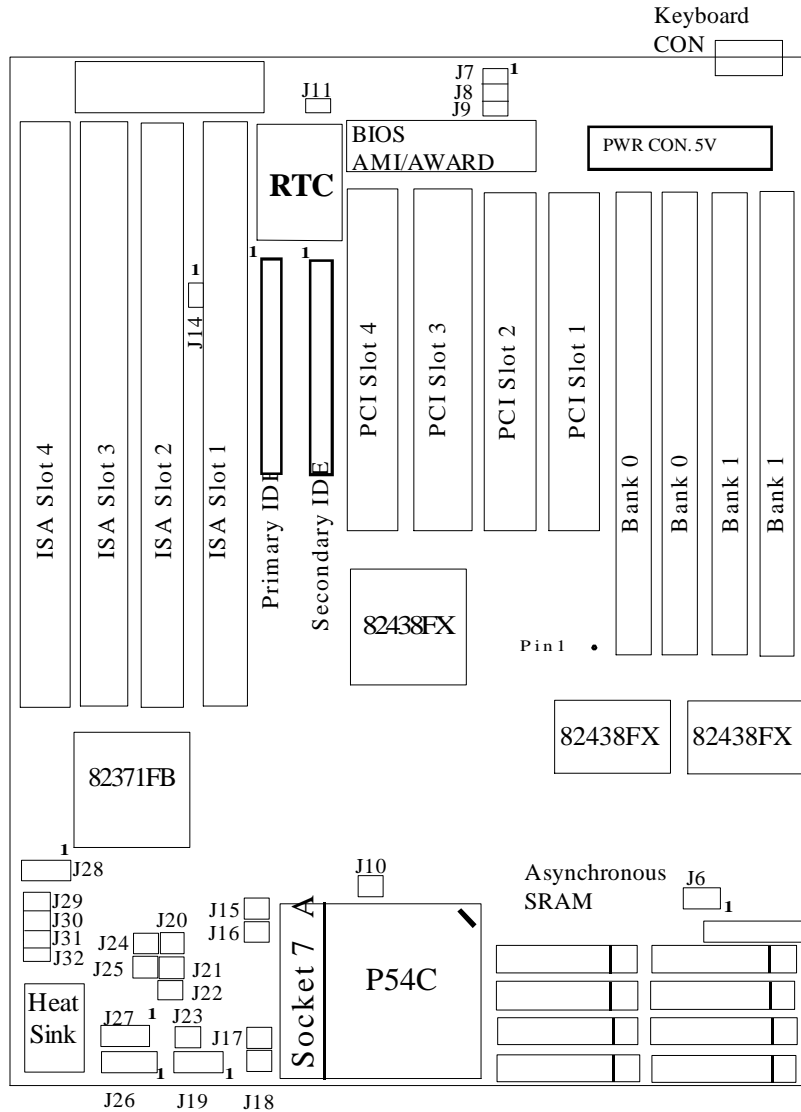
*J20: On Board IDE LED

Used to show on board IDE drive activity.

Only pins 1 and 2 are used.



Figure 3.5S1461 Board Layout



J15	J16	J20	J24	CPU Speed
On	On	Off	Off	75 MHz
Off	On	Off	Off	90 MHz
On	Off	Off	Off	100 MHz
Off	On	On	Off	120 MHz
On	Off	On	Off	133 MHz
On	On	Off	On	150 MHz
Off	On	On	On	150 MHz
On	Off	On	On	166 MHz

J6	J22	J21	Cache Size
2-3	On	Off	256KB
1-2	Off	On	512KB

J26: Keylock J23: Turbo LED
 J19: IDE LED J17: Turbo Switch
 J18: Reset J27: Speaker

* The following jumpers must be left at the default positions.

J10: Closed J7: 1-2 J9: 1-2
 J31: Closed J8: 1-2 J14: 2-3

*All other jumpers are reserved.



3.6 Quick Reference For Jumpers & Connectors (S1461)

* : 5V Power Connector

1	Power Good Signal
2,10,11,12	VCC (+5V)
3	+12V
4	-12V
5,6,7,8	GND
9	-5V

* J18: Reset Connector

"Open" for normal operation
 "Closed" for hardware reset

* J6,J22,J21: L2 Cache Size Selection

Cache Size:	J6	J22	J21
256KB	2-3	On	Off
512KB	1-2	Off	On

* J26: Power LED and Keylock Connector

1	LED anode (+)
2	NC
3	LED cathode (-)
4	Keylock
5	GND

* J27: Speaker Connector

1	Data Out
2	NC
3	GND
4	+5 VDC

* J17: Turbo Switch Connector

Hardware turbo switch is not supported.
 Use <Ctrl> +<Alt>+<-> for non-turbo mode.
 Use <Ctrl>+<Alt>+<+> for turbo mode.





* J23: Turbo LED Connector

1	LED cathode (-)
2	LED anode (+)

* J15, J16, J20: System Speed Selection

J15	J16	J20	J24	CPU Speed
On	Off	On	On	166MHz Pentium
Off	On	On	On	150MHz Pentium
On	On	Off	On	150MHz Pentium
On	Off	On	Off	133MHz Pentium
Off	On	On	Off	120MHz Pentium
On	Off	Off	Off	100MHz Pentium
Off	On	Off	Off	90MHz Pentium
On	On	Off	Off	75MHz Pentium.

* J20 & J24: CPU Clock Multiplier

J20	J24	CPU Mode
Off	Off	CPU x 1.5(75,90 & 100MHz)
On	Off	CPU x 2 (120 & 133MHz)
On	On	CPU x 2.5(150 & 166MHz)
Off	On	CPU x 3 (150MHz)

* J11: Reset CMOS and clear Password

Used to reset CMOS and clear BIOS Password.

OFF: Normal Operation

ON: Clears Password and resets CMOS to default.

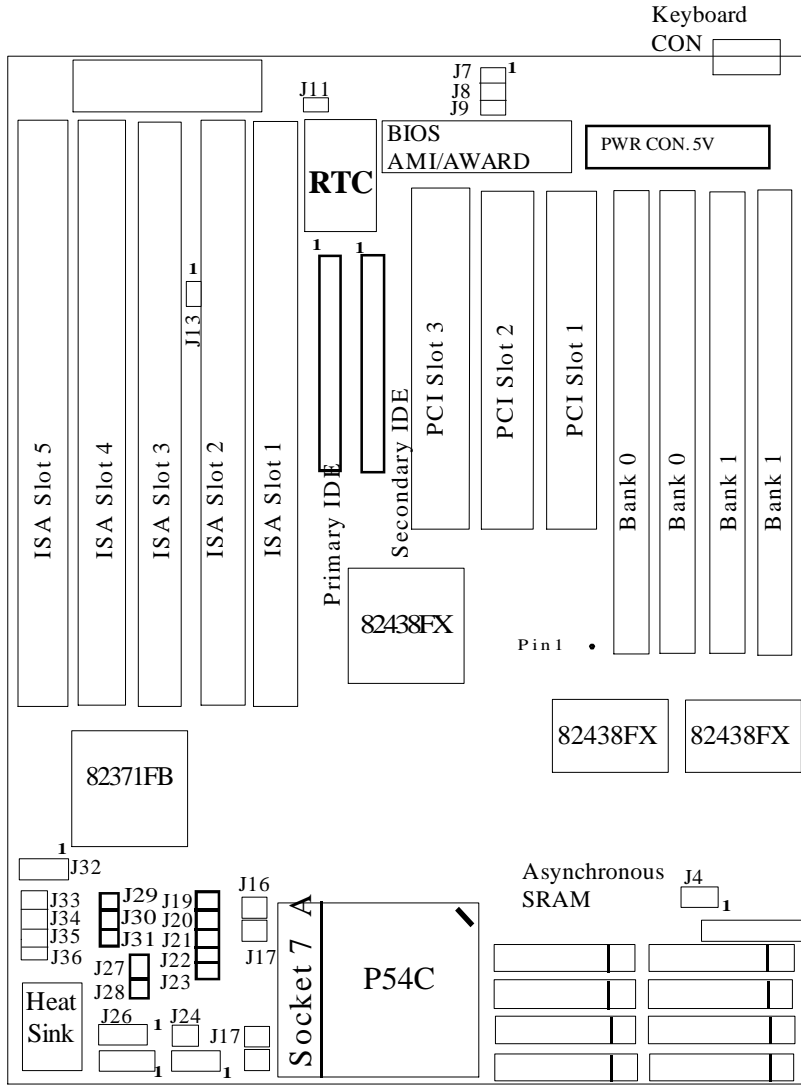
* J19: On Board IDE LED

Used to show on board IDE drive activity.

Only pins 1 and 2 are used.



Figure 3.7 S1463 Board Layout Rev02



J4	J20	J21	Cache Size
2-3	Off	On	256KB
1-2	On	Off	512KB

J16	J17	J19	J23	CPU Speed
On	On	Off	Off	75MHz
Off	On	Off	Off	90MHz
On	Off	Off	Off	100MHz
Off	On	On	Off	120MHz
On	Off	On	Off	133MHz
Off	On	On	On	150MHz
On	On	Off	On	166MHz

- J14: Reset
- J15: Turbo-Switch
- J18: IDE LED
- J24: Turbo-LED
- J25: Keylock
- J26: Speaker

Default settings
 J7: pins 1-2 J27:1-2
 J8: pins 1-2 J28:1-2
 J9: pins 1-2
 J13: pins 2-3
 J34: On
 *All other jumpers are reserved.



3.8 Quick Reference For Jumpers & Connectors (S1463)

* : 5V Power Connector

1	Power Good Signal
2,10,11,12	VCC (+5V)
3	+12V
4	-12V
5,6,7,8	GND
9	-5V

* J14: Reset Connector

"Open" for normal operation
 "Closed" for hardware reset

* J4,J20,J21: L2 Cache Size Selection

Cache Size:	J4	J20	J21
256KB	2-3	Off	On
512KB	1-2	On	Off

* J25: Power LED and Keylock Connector

1	LED anode (+)
2	NC
3	LED cathode (-)
4	Keylock
5	GND

* J26: Speaker Connector

1	Data Out
2	NC
3	GND
4	+5 VDC

* J15: Turbo Switch Connector

Hardware turbo switch is not supported.
 Use <Ctrl> +<Alt>+<-> for non-turbo mode.
 Use <Ctrl>+<Alt>+<+> for turbo mode.





* J24: Turbo LED Connector

- 1 LED cathode (-)
- 2 LED anode (+)

* J16, J17, J19, J27, J28, J23, J34: System Speed Selection

J16	J17	J19	J23	CPU Speed
On	On	Off	Off	75MHz
Off	On	Off	Off	90MHz
On	Off	Off	Off	100MHz
Off	On	On	Off	120MHz
On	Off	On	Off	133MHz
On	On	Off	On	150MHz
Off	On	On	On	150MHz
On	Off	On	On	166MHz

* J11: Reset CMOS and clear Password

Used to reset CMOS and clear BIOS Password.

OFF: Normal Operation

ON: Clears Password and resets CMOS to default.

* J18: On Board IDE LED

Used to show on board IDE drive activity.

Only pins 1 and 2 are used.



3.9 DRAM Installation

The mainboard can be installed with 1/2/4/8/16/32 MB 72 pin 60 or 70 ns Fast Page or EDO (Extended Data Out) DRAM SIMM modules. The DRAM memory system consists of 2 banks (0-1). Each bank requires 2 SIMM modules to achieve 64 bit bus transfer and proper operation. The total memory size can be from 4MB to 128MB. Various DRAM configurations are shown on the following table.

Bank 0	Bank1	Total
512kb x 32	None	4mb
512kb x 32	512kb x 32	8mb
1mb x 32	None	8mb
1mb x 32	512kb x 32	12mb
1mb x 32	1mb x 32	16mb
2mb x 32	None	16mb
2mb x 32	1mb x 32	24mb
2mb x 32	2mb x 32	32mb
4mb x 32	None	32mb
4mb x 32	1mb x 32	40mb
4mb x 32	2mb x 32	48mb
4mb x 32	4mb x 32	64mb
8mb x 32	None	64mb
8mb x 32	1mb x 32	72mb
8mb x 32	2mb x 32	80mb
8mb x 32	4mb x 32	96mb
8mb x 32	8mb x 32	128mb

Each bank may use either 1-sided or 2-sided SIMMs. All SIMMs must be Fast Page Mode DRAM or EDO DRAMs with speeds less than or equal to 70ns. Parity or Non-Parity SIMMS can be used. SIMM modules must be installed in pairs.

Refer to Fig. 3.2 for DRAM installation location. Pin-1 of the SIMM module must match the Pin-1 of SIMM socket. Insert the DRAM SIMM module into the socket at a 45 degree angle. If the SIMM module is inserted on the wrong side, it can not be plugged into the socket. After insertion, press the SIMM module in a vertical direction until both left and right metal holders latch.



3.10 CPU Installation

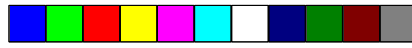
Several types of CPUs (75 thru 166 MHz) can be used on S1461/3/6. Please refer to the previous pages for the correct CPU jumper settings for your board.

- * 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 in order to avoid being broken by the pressure of CPU insertion.
- * **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. When the CPU is installed, the lever should snap into place at the side of the socket.





3.11 Understanding The Different Clock Speeds

When rating Pentium CPU clock speeds, remember it is determined by their internal frequency. The following chart shows the different CPU, mainboard and PCI frequencies. As you may notice, all the Intel Pentium CPUs use an internal clock multiplier (x3, x2.5, x2 or x1.5 Motherboard speed).

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	66.67 MHz	33 MHz
150 MHz	60 or 50 MHz	30 or 25 MHz
166 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.



3.12 Upgrading Cache Memory

The S1461/3 main board comes standard with a 256KB 2nd level cache. It uses 8pcs of 32K*8 SRAM's. You can upgrade the cache to 512KB with 64K * 8 SRAM to improve system performance.

NOTICE: The 64K*8 SRAM chip is longer in length than the 32K*8 chip. Do not insert the 32 K*8 SRAM chip into the top four pin holes of the socket, it could cause serious damage to your SRAM chips. Refer to the diagram below.

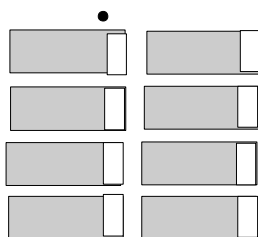
All SRAM chips must be 15ns (nanoseconds) or faster. The chart below shows the chips you need for each configuration.

S1461	J22	J21	J6	SRAM Size	Chip type and Qty needed	Pin configuration
S1463	J21	J20	J4			
	On	Off	2-3	256KB	Eight 32K*8	28 pin/chip
	Off	On	1-2	512KB	Eight 64K*8	32 pin/chip

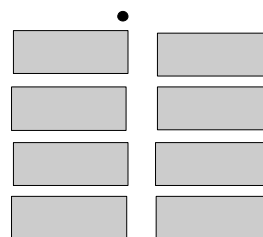


* All the standard SRAMs must have 3.3V output. Please contact the *MANUFACTURER* if upgrades for the SRAMs are needed.

Installation of 2nd Level Cache Memory



256 KB Cache
Use 32K*8 SRAM's



512 KB Cache
Use 64K*8 SRAM's





For the S1466, the synchronous SRAM can be upgraded only in boards that use sockets. A special tool is required to unplug SRAM chips from the PLCC sockets.

The table below shows the configuration sizes of the SRAM:
(All SRAM must be 10ns or faster)

SRAM Cache Size	Chip Type and Qty	J1	J23	J22
256KB	Four 32K*18	2-3	On	Off
512KB	Four 64K*18	1-2	Off	On

3.13 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.

3.14 Speaker Connector Installation

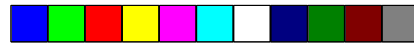
S1461/3/6 provides a 4-Pin header J26(S1463/6) or J27(S1461) to connect the speaker. The polarity can go either way.

3.15 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.

Because the Pentium CPU cannot slow its clock speed on the fly, the S1461/3/6 uses a simulation method to implement TURBO switching. The jumper marked J16(S1466), J15(S1463) or J17(S1461) on the mainboard should be connected to the TURBO switch on the case panel.





3.16 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 J21 for the S1466, J24 for the S1463 or J23 for the S1461 in the correct direction

3.17 Hardware Reset Switch Connector Installation

The RESET switch on your cases' display panel provides users with the HARDWARE RESET function which is almost the same as power on/off. The system will do a cold start after the RESET switch is pushed by the user. The RESET switch is a 2 pin connector and should be installed on jumper J17 for the S1466, J14 for the S1463 or J18 for the S1461.

3.18 Flash EPROM-Jumper J7, J8 and J9

The S1461/3/6 uses flash memory to store BIOS programs. It can be updated as new versions of the BIOS become available. The flash utility will guide you through the process step by step.

J7, J8 and J9 determine which type of EPROM is used. These jumpers have been set to match the on-board BIOS chip. The factory default for the S1461/3/6 is on pins 1-2 for J7 and 1-2 for J8 and J9. Depending on the type of EPROM used, some boards will have J7 on pins 2-3.

Refer to chapter 5 for Flash EPROM upgrade procedures.

3.19 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 J10 for the S1466 or J11 for the S1461 and S1463.
- d. Wait for 15 seconds then remove the jumper from J10(S1466) or J11(S1461,S1463) 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 default.



3.20 Peripheral Device Installation

After all the jumpers on the mainboard have been set, the it can be mounted into the case. Then proceede in installing the I/O controller, display controller, and any other peripheral devices.

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

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

3.21 Turbo /Non-Turbo hotkeys

press <Ctrl> + <Alt> + <-> : turn off turbo function.

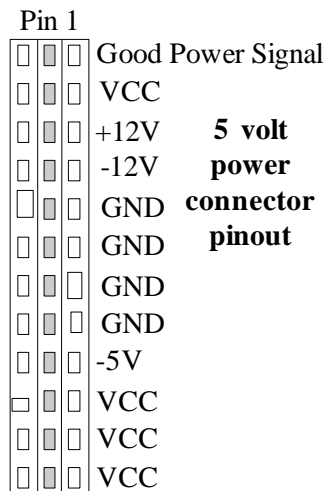
press <Ctrl> + <Alt> + <+> : turn on turbo function.





3.22 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.

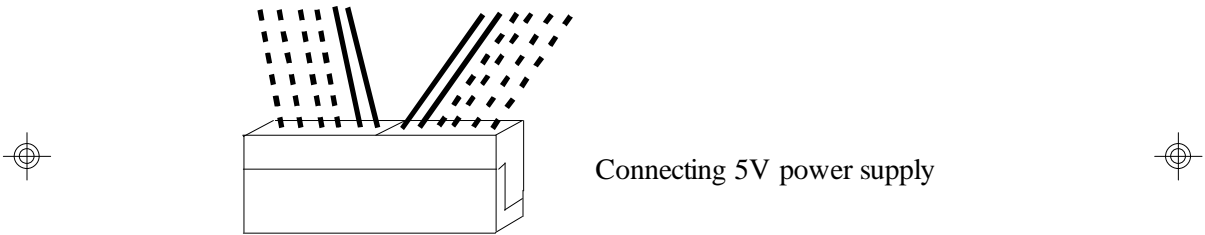
Orient the connectors so the black wires are in the middle of the 5V power supply.

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 not 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 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 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 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.

* Unless necessary, do not use Non-Turbo Mode. (Always keep system in turbo mode)





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 4.1) 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 4.1: 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 Intel Triton 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.

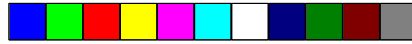
* **Save and exit setup**

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 4.2) 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 4.2: 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 paramters 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

If a hard disk has not 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.

No errors	Whenever the BIOS has detected a non-fatal error, the system will be stopped and you will be prompted.
All 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

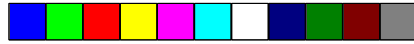
The category is for display-only and it is determined by POST Power On Self Test of the BIOS.

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

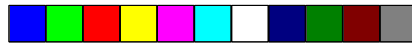


ROM ISA BIOS BIOS FEATURES SETUP AWARD SOFTWARE, INC.



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		
Typematic Rate Setting	:Disabled		
Typematic Rate (Chars/sec)	:6		
Typematic Delay (msec)	:250		
Security Option	:Setup		
		ESC :Quit ↑ ↓ → ← :Select Item	
		F1 :Help PU/PD/+/- :Modify	
		F5 :Old Values (Shift)F2 :Color	
		F6 :Load BIOS Defaults	
		F7 :Load Setup Defaults	





*** 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**

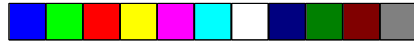
This category determines which drive the computer searches first for the disk operating system (i.e. DOS). Default value is A,C.

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 determine 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. The Typematic Rate (6, 8, 10, 12, 15, 20, 24, or 30 characters per second) and Typematic Rate Delay (250, 500, 750, or 1000 milliseconds) control 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

*** 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

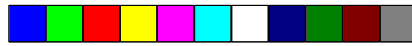
This screen controls the settings for the board's chip set. The controls for this screen are the same as the previous screen.

The Chipset Features Screen

ROM ISA BIOS
 CHIPSET SETUP UTILITY
 AWARD SOFTWARE, INC.

DRAM RAS# Precharge Time :4	PCI Concurrency :Disabled
DRAM R/W Leadoff Timing :8/6	PCI Streaming :Disabled
DRAM RAS to CAS Delay :3	PCI Bursting :Enabled
DRAM Read Burst Timing :x2222	
DRAM Write Burst Timing :x3333	
System BIOS Cacheable :Enabled	
Video BIOS Cacheable :Enabled	
8 bit I/O Recovery Time :8	
16 bit I/O Recovery Time :4	
Memory Hole at 15M/16M :Disabled	
IDE Block Mode :Disabled	ESC :Quit ↑ ↓ → ← :Select Item
IDE Primary Master PIO :Auto	F1 :Help PU/PD/+/- :Modify
IDE Primary Slave PIO :Auto	F5 :Old Values (Shift)F2 :Color
IDE Secondary Master PIO :Auto	F6 :Load BIOS Defaults
IDE Secondary Slave PIO :Auto	F7 :Load Setup Defaults
On-Chip Primary PCI IDE :Enabled	
On-Chip Secondary PCI IDE :Enabled	
PCI Slot IDE 2nd Channel :Enabled	





* **DRAM RAS# Precharge Time:**

This can be set to either 3 or 4. Default value is 4.

* **DRAM R/W Leadoff Timing**

This option depends on the systems DRAM speed. Use 7/5 for 60ns and 8/6 for 70ns DRAM. Default is 8/6.

* **DRAM RAS to CAS Delay**

This can be set to 2 or 3. The recommended setting is 3. Default is 3.

* **DRAM Read Burst Timing**

This option depends on the systems DRAM speed. Use x2222 for 60ns DRAM and x3333 for 70ns DRAM.

* **DRAM Write Burst Timing**

This option depends on the systems DRAM speed. Use x3333 for 60ns DRAMs and x4444 for 70ns DRAMs.

* **System and Video Cacheable**

This option lets you "Enable" or "Disable" caching for the video and system BIOS regions. Default is disabled. Enable for best performance

* **Memory Hole at 15M/16M**

There are two options "Disabled", and "Enabled". Default is disabled.

* **IDE Block Mode**

This option lets you enable or disable the IDE Block Mode transfer. This option is dependent on your IDE hard drive. Default value is Disabled.

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

This option lets you select PIO modes for your IDE drives. The default is Auto and will let the system select the correct PIO mode.

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

This option enables or disables the on board IDE Channels. Default value is Enabled.

* **PCI Concurrency**

This option Enables or Disables PCI Concurrency. Default value is Disabled.

* **PCI Streaming**

This option Enables or Disables PCI Streaming. Default value is Disabled.

* **PCI Bursting**

This option Enables or Disables PCI Bursting. Default value is enabled.

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
<u>Power Down Activities</u>			
Com Ports Accessed	:Off		
LPT Ports Accessed	:Off		
Drive Ports Accessed	:Off		

Power Management

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

PM Control by APM

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

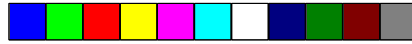
ROM ISA BIOS
PCI SLOT CONFIGURATION
AWARD SOFTWARE, INC.

<p>Slot1 Using INT# : AUTO Slot2 Using INT#: AUTO Slot3 Using INT#: AUTO Slot4 Using INT#: AUTO 1st Available IRQ#: 10 2nd Available IRQ#: 11 3rd Available IRQ# 12 4th Available IRQ# 9 PCI IRQ Activated By: Level PCI IDE IRQ Map To: Auto Primary IDE INT#: A Secondary IDE INT#: B</p>	<p>ESC: Quit ↑ ↓ → ← :Select Item F1 : Help PU/PD/+/- :Modify F5 : Old Values (Shift)F2 :Color F6 : Load BIOS Defaults F7 : Load Setup Defaults</p>
--	--

* PCI Slot 1/Slot 2/Slot 3/slot 4 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



***1st Available IRQ#**

***2nd Available IRQ#**

***3rd Available IRQ#**

***4th Available IRQ#**

Select four available IRQs assignments to PCI slots INT

***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

* If you use FOUR NCR 810/825 SCSI-PCI cards in the system, you need to assign IRQ 10 for the card that is in slot 1. In the same way, assign IRQ 11 for the card in slot 2, assign IRQ 12 for the card in slot 3, and assign IRQ 9 for the card in slot 4. However, no matter which slot the SCSI-PCI card was inserted, you should use INT A to enable SCSI-PCI card itself. The system will automatically assign those IRQs to INTA, INTB, INTC and INTD.

49. LOAD SETUP DEFAULTS

ROM ISA BIOS
CMOS SETUP UTILITY
AWARD SOFTWARE INC.

STANDARD CMOS SETUP	PASSWORD SETTING
BIOS FEATURES SETUP	IDE HDD AUTO DETECTION
CHIPSET F	SETUP
PCI SLOT	T SAVING
LOAD SETUP DEFAULTS	
<p>ESC : Save & Exit Setup F10 : Quit</p> <p>↑ ↓ → ← :Select Item (Shift)F2 :Change Color</p>	
<p>Load SETUP Defaults except standard CMOS SETUP</p>	

* Load SETUP defaults

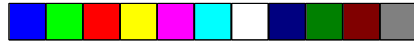
To load SETUP default values to CMOS SRAM, enter "Y". If not, enter "N"

* If any problem has occurred, loading the SETUP DEFAULTS is recommended.

4.10. PASSWORD SETTING

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

ENTER PASSWORD



ROM ISA BIOS
 CMOS SETUP UTILITY
 AWARD SOFTWARE, INC.

STANDARD CMOS SETUP	PASSWORD SETTING
BIOS FEATURES SETUP	IDE HDD AUTO DETECTION
CHIPSET FEATURES SETUP	SCSI/RAID CONFIGURATION
PCI SLOT CONFIGURATION	BOOT 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.

4.11. 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.

4.12. 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 F... SETUP	
PCISLOT C... UT SAVING	
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.

4.13 KEYBOARD SETTING FUNCTION

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

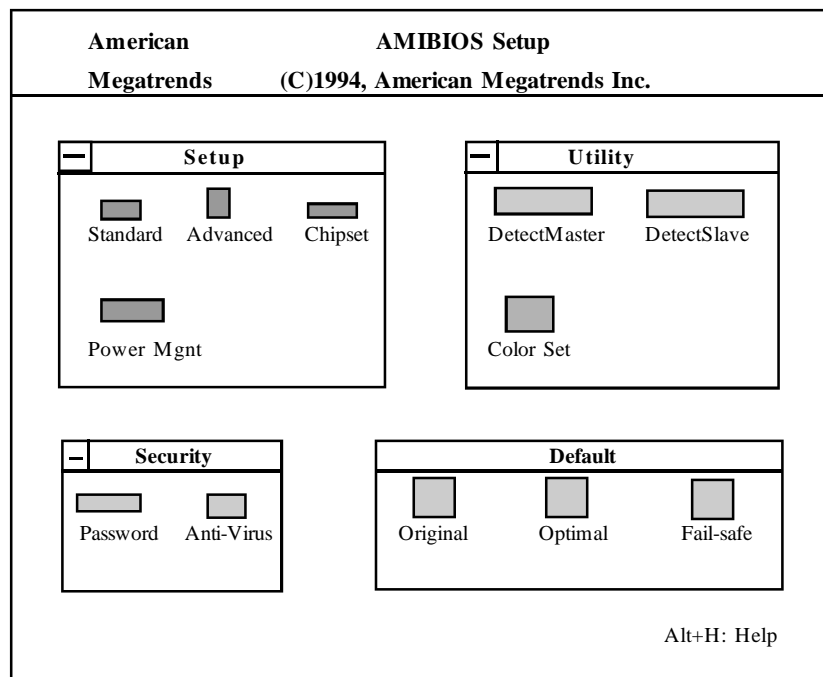
- | | |
|----------------|--|
| "CTRL_ALT_DEL" | -Pressing these keys simultaneously will cause the system to WARM START (Soft Reset) |
| "CTRL_ALT_[+]" | -Pressing these keys simultaneously will change the system speed to high speed (Turbo, all cache memory enabled) |



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 on the "DEL" key during the memory test/count.

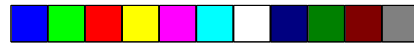
The WINBIOS Setup screen consists of the following option groups:



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 Master

Primary 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 must be selected if a SCSI Disk Drive installed.

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.

Typematic Rate (Chars/Sec)

Set the rate at which characters on the screen repeat when a key is pressed and held down. The Optimal setting is 30 characters per second. The Fail-Safe default setting is *disabled*.

System Keyboard

Specify if error messages are displayed when a keyboard is not attached. This option permits you to configure workstations with no keyboards. The Optimal and Fail-Safe default settings are *Present*.



Primary Display

Configures the type of monitor attached to the computer. The Optimal and Fail-Safe default settings are *VGA/EGA*.

Above 1MB Memory Test

When this option is *enabled*, the system will test the entire memory pool during the Power On Self Test(POST). If it is *disabled*, the system will only count the amount of available memory without testing it.

Hit "DEL" Message Display

Enable or *disable* the "HitDELETE key" message upon boot up. The default is *enabled*.

Extended BIOS RAM Area

Specify in this option if the top 1 KB of the system programming area begins at 639K (*DOS 1K*) or at address *0:300*. In most instances *0:300* should be used. The default is *0:300*.

Wait for "F1" if Any Error

Enable this option to display the message "Hit F1 to continue" when the system encounters an error during POST. The default is *Enabled*.

System Boot Up Num Lock

This option lets you turn on or off the num lock for the keyboard during boot up. The default is *ON*.

Floppy Drive Seek at Boot

This option *enables* or *disables* the floppy drive seek during POST. The default is *disabled*.

Floppy Drive Swapping at Boot

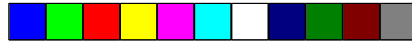
When *enabled*, the system allows the floppy drives to swap drive letters with each other. The default is *disabled*.

System Boot Up Sequence

This option determines which disk drive the system will attempt to boot from first. The options are "*A: to C:*" or "*C: to A:*".

The default is "*A: to C:*"





Password Checking

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 password prompt appears if WinBIOS Setup is executed. The default is *Setup*.

Cache Memory

The options are "*Both*"(L1 and L2 enabled), "*Internal*"(L1 enabled and L2 cache is disabled) and "*Disabled*" (Both L1 and L2 cache disabled). The default is "*Both*"

System BIOS Shadow Cacheable

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

Video ROM and Adaptor ROM

The video and 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 video ROM should be set for *cache* for best performance. 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*.

IDE Block Mode

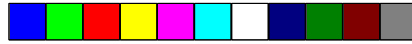
If you know the maximum s/b (Sectors per Burst) of your drive then it can be chosen here. If you are not sure about your drive specs then choose *auto*. The options are *disabled*, *auto*, *2 s/b*, *4 s/b*, *8 s/b*, *16 s/b*, *32 s/b* or *64 s/b*. For drives that don't support Block Mode transfers, this option should be *disabled*.

Onboard PCI IDE

You can *enable* or *disable* the onboard PCI controller. If it is set for *auto*, the system will auto-detect for a device attached to the controller. The default is *Auto*.

Onboard PCI IDE Prim. PIO Mode

This option lets you select the PIO Mode for the IDE HDD that is attached to your primary controller. Choices are from *mode 0* thru *mode 4*. If you are not sure which mode your drive supports, use the *Auto option*.



Onboard PCI IDE Sec. PIO Mode

This option lets you select the PIO Mode for the IDE HDD that is attached to your secondary controller. Choices are from *mode 0* thru *mode 4*. If you are not sure which mode your drive supports, use the *Auto* option. The default is *Auto*.

Onboard PCI IDE 32bit Mode

This option *Enables* or *Disables* PCI IDE 32-bit transfer mode. Be aware that not all drives support this mode. The default is *enabled*.

Primary Master LBA Mode

Primary Slave LBA Mode

Secondary Master LBA Mode

Secondary Slave LBA Mode

This option *enables* or *disables* LBA (Logical Block Addressing) support for each of the drives. LBA Mode is an advanced method for accessing data on IDE drives. Data is accessed by block addresses rather than the traditional Cylinder-Header-Sector scheme. LBA Mode also breaks the 528MB size limit imposed by older IDE drives. *Enable* only if your drive can support LBA. The default is *disabled*.

Secondary Ctrl Drives Present

This option specifies the number of IDE drives controlled by the onboard secondary IDE controller. The settings are *None*, *1(drive)*, or *2(drives)*. The default is *None*.

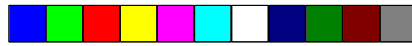
5.3 Advanced Chipset

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*.

DRAM Speed

This option should be set according to the speed of the DRAM in the system. The value of this option determines how the DRAM timing should be programmed in the chipset. The options are *60ns* and *70ns*. The default is *60ns*.



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*.

PCI Burst Mode

This option lets you *enable* or *disable* support for PCI Burst Mode. PCI Burst Mode should be enabled for best performance.

The default is *enabled*.

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 the CPU to each set of palette registers of every video device (ISA VGA and a PCI VGA).

The options are *enabled* or *disabled*. The default is *enabled*.

IRQx Available to (x= IRQ 3,4,5,7,9,10,11)

These options allow interrupts to be specified as being used by legacy ISA devices or that they are available for PCI/PnP devices.

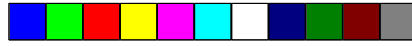
The options are *ISA/EISA* or *PCI/PnP*.

PCI IDE Card Selection

PCI Primary IDE INT# Line

PCI Secondary IDE INT# Line

These options indicate the presence and information of an offboard PCI IDE device. The first option indicates the device number of the PCI IDE and the other options indicate how IRQ14 and IRQ15 are routed to the device. The default is *absent*.



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 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).

5.6 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*.

5.7 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 ROM 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
*S61AWXX.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 J7, J8, and J9.

For boards that use the 5 Volt Flash chip, J7 will be on pins 1-2 and pin 3 will be cut. No jumpers changes are needed to flash a new BIOS on these boards.

If J7 has a pin 3, then the board is using a 12 Volt Flash chip and J7 needs to be changed to pins 2-3 before flashing to the new BIOS. When flashing is completed, put J7 back to pins 1-2. J8 and J9 should always be on pins 1-2 in either case.

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 CONFIGSYS 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 CONFIGSYS 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 Triton-2A59CT51	Date:4/13/95
File Name to Program:	
Error Message:	

Type in the whole file name, e.g. A61AW10.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 AT TECHNICAL INFORMATION

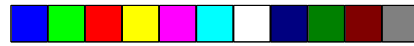
7.1 I/O BUS CONNECTOR PIN OUT

7.1.1 ISA SLOT PIN OUT

GND	B01	A01	-I/O CH CHK	-MEMC16	D01	C01	SBHE
RESET	B02	A02	SD07	-I/OCS16	D02	C02	LA23
+5V	B03	A03	SD06	IRQ10	D03	C03	LA22
IRQ9	B04	A04	SD05	IRQ11	D04	C04	LA21
-5V	B05	A05	SD04	IRQ12	D05	C05	LA20
DRQ2	B06	A06	SD03	IRQ15	D06	C06	LA19
-12V	B07	A07	SD02	IRQ14	D07	C07	LA18
0WS	B08	A08	SD01	-DACK0	D08	C08	LA17
+12V	B09	A09	SD00	DRQ0	D09	C09	-MEMR
GND	B10	A10	-I/O CH RDY	-DACK5	D10	C10	-MEMW
-SMEMW	B11	A11	AEN	DRQ5	D11	C11	SD08
-SMEMR	B12	A12	SA19	-DACK6	D12	C12	DS09
-IOW	B13	A13	SA18	DRQ6	D13	C13	DS10
-IOR	B14	A14	SA17	-DACK7	D14	C14	DS11
-DACK3	B15	A15	SA16	DRQ7	D15	C15	DS12
-DRQ3	B16	A16	SA15	+5V	D16	C16	DS13
DACK1	B17	A17	SA14	-MASTER	D17	C17	DS14
DRQ1	B18	A18	SA13	GND	D18	C18	DS15
-REFRESH	B19	A19	SA12				
BCLK	B20	A20	SA11				
IRQ7	B21	A21	SA10				
IRQ6	B22	A22	SA09				
IRQ5	B23	A23	SA08				
IRQ4	B24	A24	SA07				
IRQ3	B25	A25	SA06				
-DACK2	B26	A26	SA05				
T/C	B27	A27	SA04				
BALE	B28	A28	SA003				
+5V	B29	A29	SA02				
OSC	B30	A30	SA01				
GND	B31	A31	SA00				

7.1.2 PCI-BUS SLOT PIN OUT

-12V	A01	B01	NC
NC	A02	B02	+12V
GND	A03	B03	NC
NC	A04	B04	NC
VCC	A05	B05	VCC
VCC	A06	B06	INT#A
INTB#	A07	B07	INT#C
INTD#	A08	B08	VCC
PST#1	A09	B09	NC
NC	A10	B10	VCC
PST#2	A11	B11	NC
GND	A12	B12	GND
GND	A13	B13	GND
NC	A14	B14	NC
GND	A15	B15	RST#
CLK	A16	B16	VCC
GND	A17	B17	GNT#
REQ#	A18	B18	GND
VCC	A19	B19	NC
AD_31	A20	B20	AD_30
AD_29	A21	B21	NC
GND	A22	B22	AD_28
AD_27	A23	B23	AD_26
AD_25	A24	B24	GND
NC	A25	B25	AD_24
CBE#3	A26	B26	IDSEL
AD_23	A27	B27	NC
GND	A28	B28	AD_22
AD_21	A29	B29	AD_20
AD_19	A30	B30	GND
NC	A31	B31	AD_18
AD_17	A32	B32	AD_16
CEB#2	A33	B33	NC
GND	A34	B34	FRAME#
IRDY#	A35	B35	GND
NC	A36	B36	STOP#
DEVSEL#	A37	B37	NC
GND	A38	B38	SDONE
LOCK#	A39	B39	SBO#
PERR#	A40	B40	GND
NC	A41	B41	PAR
SERR#	A42	B42	AD_15
NC	A43	B43	NC
CBE#1	A44	B44	AD_13
AD_14	A45	B45	AD_11
GND	A46	B46	GND
AD_12	A47	B47	AD_09
AD_10	A48	B48	CBE#0
GND	A49	B49	NC
AD_08	A50	B50	AD_06
AS_07	A51	B51	AD_04
NC	A52	B52	GND
AD_05	A53	B53	AD_02
AD_03	A54	B54	AD_00
GND	A55	B55	VCC
AD_01	A56	B56	NC
VCC	A57	B57	VCC
NC	A58	B58	VCC
VCC	A59	B59	
VCC	A60	B60	
	A61	B61	
	A62	B62	



7.2. TIMER & DMA CHANNEL MAP

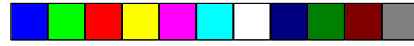
TIMER MAP: TIMER Channel-0 system timer interrupt
 TIMER Channel-1 DRAM REFRESH request
 TIMER Channel-2 SPEAKER tone generator

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

7.3 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 adapter
 15 Available



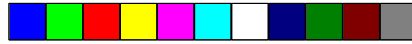
7.4 RTC & CMOS RAM MAP

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

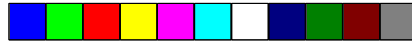
Appendix A: Post Codes

ISA POST codes are typically output to port address 80h (Award BIOS)

POST	Name	OEM specific-Cache control
C0	Turn off Chipset cache	Processor Status (1 FLAGS) verification.
1	Processor Test 1	Test the following processor status flags; carry, zero, sign, overflow. The BIOS will set each of these flags, verify they are set, then turn each flag off and verify it is off
2	Processor Test 2	Read/Write/Verify all CPU registers except SS,SP, and BP with data pattern FF and 00
3	Initialize chips	Disable NMI, PIE, AIE, UEI, SQWV, video, parity checking, DMA. Reset math co-processor. Clear all page registers. Initialize timer 0,1 and 2. Initialize DMA controllers 0 and 1. Initialize interrupt controllers 0 and 1.
4	Test Memory refresh toggle	Assures that memory refresh function is working.
5	Blank Video Initialize Keyboard	Keyboard initialization
6	Reserved	
7	Test CMOS and battery status	Verifies CMOS is working properly, detects a bad battery.
BE	Chipset Default	Programs chipset registers with power on BIOS default
C1	Memory presence test	OEM specific-Test to size on-board memory.
C5	Early shadow	OEM specific-early shadow enable for fast boot
C6	Cache presence test	External cache size detection
8	Setup low memory	Clear low 64K memory. Test first 64K memory.
9	Early cache initialize	Cache initialization
A	Setup Interrupt Vector Table	Initialization first 120 interrupt vectors with SPURIOUS_INT-HDLR and initialize INT 00h-1 Fh according to INT_TBL.
B	Test CMOS	Test CMOS RAM Checksum.
C	Initialize keyboard	Detect type of keyboard controller. Set NUM_LOCK status.
D	Initialize video interface	Detect CPU clock. Read CMOS location 14h to find type of video. Detect and initialize video adapter.
E	Test video memory	Test video memory, write sign-on message to screen. Setup shadow RAM. Enable shadow according to setup.
F	Test DMA controller 0	BIOS checksum test. Keyboard detect and initialization



10	Test DMA memory controller 1	Test DMA controller
11	Test DMA Page registers	Test DMA page Registers
12-13	reserved	
14	Test timer counter 2	Test 8254 timer 0 countner 2
15	Test 8259-1 Mask	Verify 8259 channel 1 masked interrupts
16	Test 8259-2 Mask	Verify 8259 channel 2 masked interrupts
17	Test Stuck 8259 interrupt bits	Turn off interrupt then verify nointerrupt mask register is on
18	Test 8259 interrupt functionality	Force interrupt and verify interrupt occured
19	Test Stuck NMI bits	Verify NMI can be cleared
1A	Check clock	Display CPU clock
1B-1F	Reserved	
20	Enable slot 0	Initialize slot 0 (system board)
21-2F	Enable slot 1-15	Initialize slot 1-15
30	Size base and Extended memory	Size base memory form 256K to 640K and Extended memory above 1MB
31	Test base and Extended memory	Test base and Extended memory
32-3B	Reserved	
3C	Setup Enabled	
3D	Initialize and install mouse	Detects if mouse is present, initialize mouse and install interrupt vectors.
3E	Setup cache controller	Initialize cache controller
41	Initialize floppy drive and controller	Initialize floppy disk drive and controller
42	Initialize hard drive and controller	Initialize hard drives
43	detect and initialize serial and parallel ports	Initialize any serial, parallel ports and gameports
44	Reserved	
45	Detect and initialize math co-processor	Initialize math co-processor
46-4D	Reserved	



4E	Manufacturing POST loop or display messages	Reboot if manufacturing POST loop pin is set. Otherwise display any messages(i.e. non fatal errors that were detected during POST) and enter setup
4F	Security check	Ask password security (optional)
50	Write CMOS	Write all CMOS values back to RAM and clear screen
51	PRE-boot enable	Enable parity checker, enable NMI and enable cache before boot
52	Initialize Option ROMS's	Initialize any option ROM's present for C8000h to EFFFFh. When FSCAN option is enabled, will initialize from C8000h to F7FFFh.
53	Initialize time value	Initialize time value in 40h: BIOS area
60	Setup Virus Protect	Setup virus protect according to setup
61	Set Boot Speed	Set system speed for boot
62	Setup NumLock	Set up NumLock status according to setup
63	Boot Attempt	Set low stack. Boot via INT 19h
B0	Spurious	If interrupt occurs in protected mode
B1	Unclaimed NMI	If unmasked NMI occurs, display Press F1 to disable NMI or F2 to reboot
E1-EF	Setup Pages	E1-Page 1, E2-Page 2, etc.

