



integration with integrity

User's Manual

Single Board Computer 3301122

Version 1.0, 2002

---

---

## **Copyrights**

This manual is copyrighted and all rights are reserved. It does not allow any non authorization in copied, photocopied, translated or reproduced to any electronic or machine readable form in whole or in part without prior written consent from the manufacturer.

In general, the manufacturer will not be liable for any direct, indirect, special, incidental or consequential damages arising from the use of inability to use the product or documentation, even if advised of the possibility of such damages. The manufacturer keeps the rights in the subject to change the contents of this manual without prior notices in order to improve the function design, performance, quality and reliability. The author assumes no responsibility for any errors or omissions, which may appear in this manual, nor does it make a commitment to update the information contained herein.

## **Trademarks**

Intel is a registered trademark of Intel Corporation.

Award is a registered trademark of Award Software, Inc.

All other trademarks, products and or product's name mentioned herein are mentioned for identification purposes only, and may be trademarks and/or registered trademarks of their respective companies or owners.

---

---

## Introduction

The SBC is based on Intel 430TX chipset that combines 66 MHz FSB, with ATA IDE up to UltraDMA/33 IDE technologies and SMI 712 4M for 2D graphics capabilities in a single package. Its onboard Dual 10Base-T/100Base-TX Fast Ethernet, CRT display controller, Flat Panel support and optional Audio function, adds communication and multimedia features to its powerful function.

The CPU including Intel® Pentium® processors are supported at 266MHz at 66MHz FSB by significantly increasing the bandwidth available for servers, while memory is expandable to 256MB SDRAM.

The Intel 430TX chipset consists of the 430TX Northbridge and 82371EB Southbridge, that includes the extremely stable and innovative intel extreme graphics technology and supports 2 X USB v1.0 ports for high speed data transmission. Other exclusive features include onboard DiskOnChip®+ 2000 socket for memory up to 256MB and Compact Flash Disk as well.

---

# Table of Contents

<b>Introduction .....</b>	<b>2</b>
<b>Specifications .....</b>	<b>5</b>
General Specifications .....	5
High Speed Multi I/O .....	5
Network Interface Controller .....	6
Display Controller .....	6
Environmental and Power .....	6
<b>Board Image .....</b>	<b>7</b>
Ordering Codes .....	8
<b>Board Layout .....</b>	<b>9</b>
<b>Jumper/Connector Quick Reference .....</b>	<b>10</b>
<b>CMOS Jumper Settings .....</b>	<b>11</b>
<b>Serial Port Selection (RS232C/422/485) .....</b>	<b>11</b>
RS-422/485 Mode on COM2 .....	11
<b>Compact Flash Disk .....</b>	<b>12</b>
Installation Instructions .....	12
<b>Dual Fast Ethernet Connectors .....</b>	<b>13</b>
LAN Port .....	13
LAN LED Indicator .....	13
<b>Power Connector .....</b>	<b>14</b>
ATX Feature Connector .....	14
P4 Power Connector .....	14
System Fan Connector .....	15
PLKL and ESPK Connector .....	16
<b>Switches and Indicators .....</b>	<b>16</b>
<b>Interface Connectors HDD, FDD .....</b>	<b>17</b>
Floppy Disk Drive (FDD1) .....	17
Enhanced IDE Connector Enhanced IDE Connector	
<b>Peripheral Port .....</b>	<b>20</b>

---

Parallel Port .....	20
USB Ports .....	20
JIR1 .....	20
CRT SVGA.....	21
AT Keyboard .....	21
PS/2 Keyboard & Mouse .....	21
COM2 for RS-232C/422/485 Port .....	22
COM2 Port with RS-422 Mode .....	22
COM2 Port with RS-485 Mode .....	22
Audio Interface Port (AUDIO1).....	23
CDROM audio interface (CD_IN1) .....	23
16-bit General Purpose I/O (GPIO1) .....	23
LCD Interface Connector	
LCD Invertor Connector (INV1) .....	25
<b>Watchdog Timer .....</b>	<b>26</b>
Timeout Values .....	26
Timeout Table .....	26
<b>System Resources .....</b>	<b>29</b>
<b>AWARD BIOS Setup .....</b>	<b>31</b>
Setup Items .....	32
Standard CMOS Setup .....	33
BIOS Features Setup .....	35
Chipset Features Setup .....	38
Power Management Setup .....	41
PnP/PCI Configuration .....	44
Integrated Peripherals .....	46
<b>POST Codes .....</b>	<b>49</b>
<b>Howto : Flash the BIOS .....</b>	<b>56</b>
What if things go wrong .....	57

---

## Specifications

### General Specifications

- **CPU** : Embedded low power Intel Pentium MMX266 MHz CPU card
- **Chipset** : Intel 430TX with Intel 82371
- **BIOS** : AWARD® Flash BIOS
- **Green Function** : power saving supported in BIOS. DOZE / STANDBY & APM
- **L2 Cache** : onboard 512 Cache
- **DRAM Memory** : One 168-pin DIMM socket supports up to 256MB SDRAM
- **Enhanced IDE with UltraDMA** : supports 1 port and up to 2 ATAPI devices, Ultra DMA transfer 33 MB/sec. One 40-pin (2.54 pitch) box header and One 44-pin (2.0 pitch) box header.
- **Watchdog Timer** : 127-level timer generates RESET when your application loses control over the system.
- **Real-time Clock** : built-in chipset with lithium battery backup. CMOS data backup of BIOS setup and BIOS default.

### High Speed Multi I/O

- **Chipset** : Intel 430TX
- **Serial Ports** : One high speed RS-232C ports (COM1). One high speed RS-232C/422/485 port COM2 (jumper selectable). Both with 16C550 compatible UART and 16 byte FIFO.
- **USB** : 2 x onboard USB ver 1.0 ports
- **SIR Interface** : onboard IrDA TX/RX port
- **Floppy Disk Drive Interface** : 2 floppy disk drives, 3½" (720 KB, 1.44 MB or 2.88 MB).
- **Bi-directional Parallel Port** : SPP, EPP and ECP mode.
- **Keyboard and Mouse Connectors** : external PS/2 KB/Mouse port (2-in-1 mini DIN) onboard AT Keyboard port (5-pin box header)
- **Audio Chipset**: ESS1989, Multistream Direct Sound and Direct Sound 3D acceleration. (Line-in, CD Audio in, MIC in, Speaker out) (optional)

---

### Network Interface Controller

- **Chipset** : 2 x Realtek 8139C, 10/100 Mbps (3301122VL2 Series)
- **Connector** : One external RJ-45 with LEDs on bracket and another one onboard

### Display Controller

- **Chipset** : SMI LynxEM4+ SM712, high performance 64-bit GUI 2D engine with 4MB SDRAM on dye
- **Display Type** : CRT (VGA, SVGA, XGA, SXGA) and TTL supported (36-bit)
- **Connectors** : external DB15 for CRT on bracket

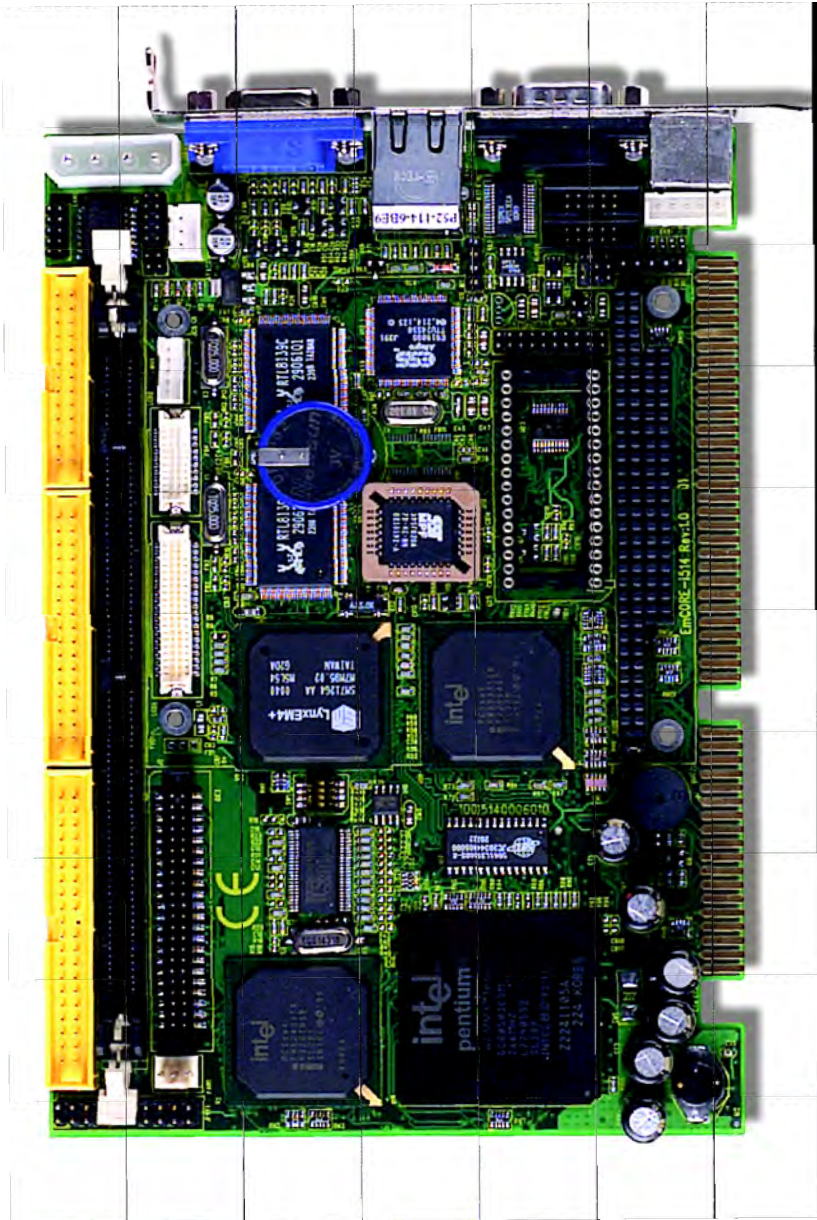
### Flash Disk

- **Compact Flash Card (CFC)**
  - **Compact Flash Socket** : supports Type I/II CFC
  - **Capacity** : up to 512MB CFC

### Environmental and Power

- **Power Requirements** : +5 V @ 2.4 A (typical); (Low Power Embedded 266MHz and 128MB SDRAM)
- **System Monitoring and Alarm** : CPU and System temperature, system voltage and cooling fan RPM.
- **Board Dimensions** : 185mm x 122mm
- **Board Weight** : 0.4Kg
- **Operating Temperature** : 0 to 60°C (32 to 140°F)

Board Image





# Warning

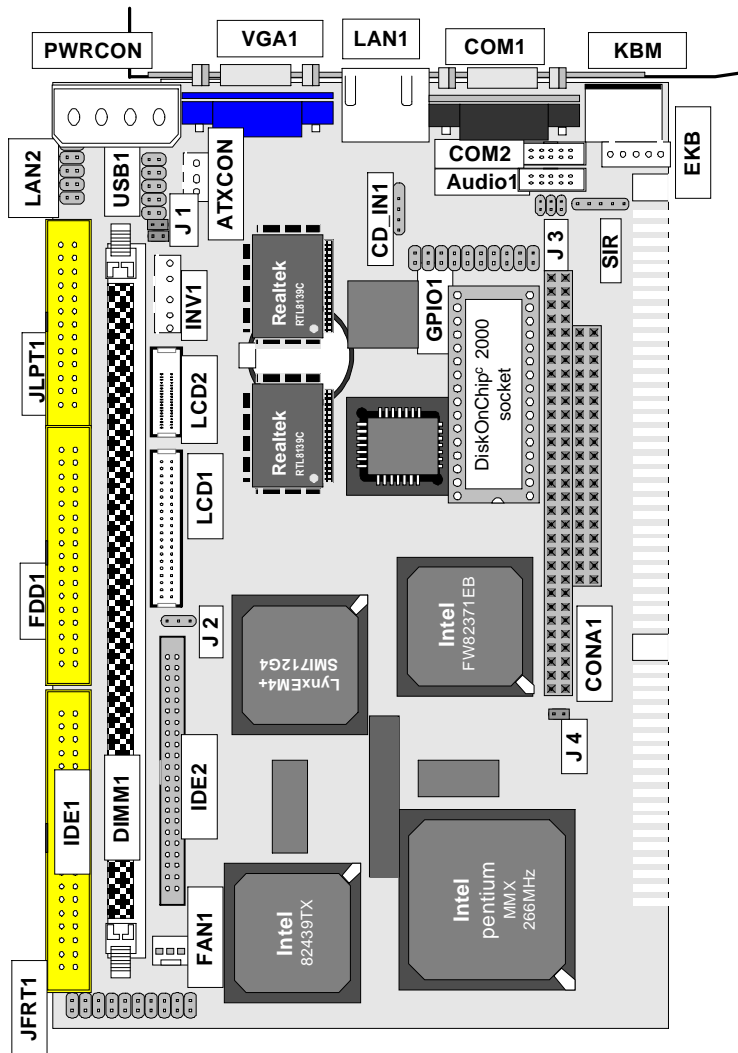
Single Board Computers and their components contain very delicate Integrated Circuits (IC). To protect the Single Board Computer and its components against damage from static electricity, you should always follow the following precautions when handling it :

1. Disconnect your Single Board Computer from the power source when you want to work on the inside
2. Hold the board by the edges and try not to touch the IC chips, leads or circuitry
3. Use a grounded wrist strap when handling computer components.
4. Place components on a grounded antistatic pad or on the bag that came with the Single Board Computer, whenever components are separated from the system

## Ordering Codes

<b>3301122B</b>	Half-size ISA Bus Embedded Intel Pentium MMX 266MHz Single Board Computer with CRT SVGA, Dual Realtek 8139C Fast Ethernet, PC/104, DiskOnChip and Compact Flash Socket
<b>3301122A</b>	Half-size ISA Bus Embedded Intel Pentium MMX 266MHz Single Board Computer with CRT SVGA, Single Realtek 8139C Fast Ethernet, PC/104, Disk OnChip and Compact Flash Socket

# Board Layout



## Jumper/Connector Quick Reference

### Jumpers

Label	Function
J2	Clear CMOS
J3	RS-232 / 422 / 485 Selected
J4	Compact Flash Disk Master or Slave Select

### Connectors

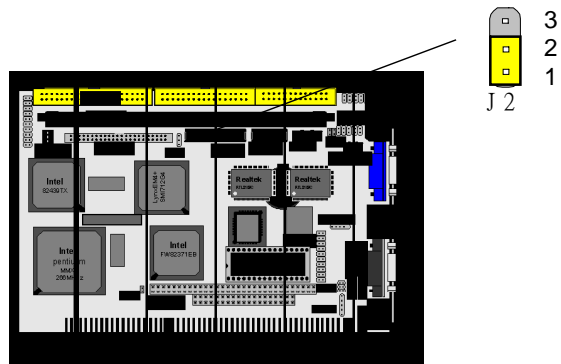
Label	Function
ATXCON	ATX Feature Connector
AUDIO1	Audio Connector
COM1	Serial Port: COM1
COM2	Serial Port: COM2
CONA1	PC104 for ISA interface connector
DIMM1	SDRAM bank 168 pin DIMM socket
FAN1	System FAN1 Connector
EKB1	External Keyboard Connector
FDD1	Floppy Disk Driver Connector
IDE1	Primary IDE Connector
IDE2	Secondary IDE Connector
KBM1	PS/2 Keyboard & Mouse
LAN1	10/100M LAN1 Connector
LAN2	10/100M LAN2 Connector
JLPT1	Parallel Port
GPIO1	16-bit GPIO
CF1	Compact Flash Disk
LCD1	DF-13 40 pin LCD Interface
LCD2	DF-13 20 pin LCD Interface
CD_IN1	CDROM Audio Interface
IR1	Infrared (IR) Connector
USB1	USB Port 0,1
JVGA	CRT SVGA Connector
PWRCON	4P Power Connector
INV1	Inverter connector
J1	LED for LAN2
JFRT1	Switches & Indicators

## CMOS Jumper Settings

CMOS Setup (J2)

Type : J1: onboard 3-pin header

CMOS Setup (J2)	J2	
Keep COMS	1-2	ON
Clear COMS	2-3	ON
Default Setting		



## Serial Port Selection (RS232C/422/485)

RS-232C/422/485 Mode select (J3)

RS-422/485 Mode on COM2

The onboard COM2 port can be configured to operate in RS-422 or RS-485 modes. RS-422 modes differ in the way RX/TX is being handled. Jumper J3 switches between RS-232 or RS-422/485 mode. All of the RS-232/422/485 modes are available on COM2.

J3 Selection	1-2	3-4	5-6
RS-232C	Close	Open	Open
RS-422	Open	Close	Open
RS-485	Open	Open	Close
default setting			

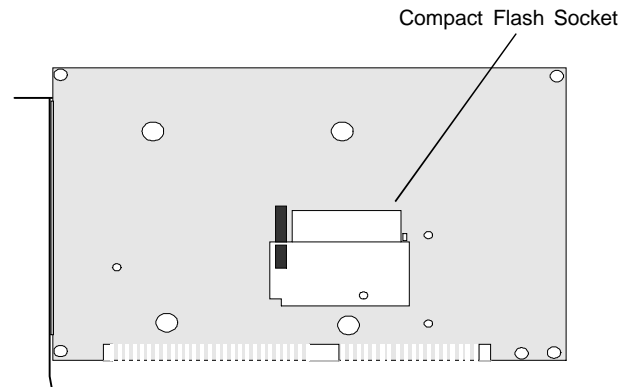
## Compact Flash Disk

Compact Flash Disk : (J4)

Mode Select	J4
Master	ON
Slave	OFF
default setting	

### Installation Instructions

1. Make sure the Single Board Computer is powered OFF.
2. Plug the Compact Flash Type/II device into its socket. Verify the direction is correct on Secondary IDE which is located in the back of SBC.
3. Powre up the system



For more information on Compact Flash disk, visit Pretech Web site at

**[http:// www.pretec.com](http://www.pretec.com)**

where you can find the utilities manual, data sheets and application notes. In addition, you can find the latest Compact Flash disk utilities.

## Dual Fast Ethernet Connectors

### LAN Port

Connector : **LAN1**

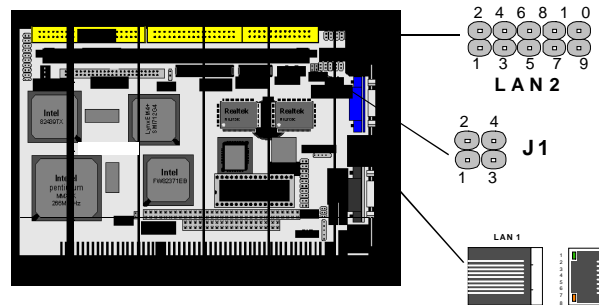
Type : external RJ-45 on bracket

Pin	1	2	3	4	5	6	7	8
Description	TX+	TX-	RX+	NC	NC	RX-	NC	NC

Connector : **LAN2**

Type : internal pin header 2x5 (2.0 pitch)

Pin	1	2	3	4	5	6	7	8
Description	TX+	TX-	RX+	NC	NC	RX-	NC	NC
	9	10						
	GND	GND						



### LAN LED Indicator

Connector : **on RJ-45 Connector**

Type : 2 LED

LED	ACT (yellow)	Speed (green)
Description	Active Transfer	100 MB mode

Connector : **J1 (for LAN2)**

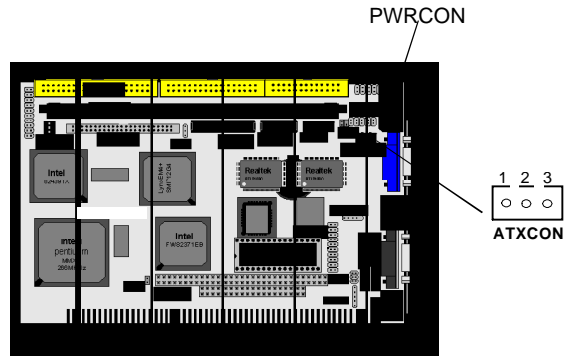
Type : Internal pin header 2x2

Pin Defined	1	2	3	4
Indicator	Active-	Active+	Link-	Link+

# Power Connector

## ATX Feature Connector

ATX Feature Connector:ATXCON



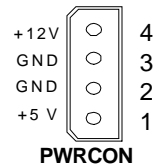
Type : onboard 3-pin Wafer connector

Pin	Description
1	PS-ON
2	GND
3	5VSB

## P4 Power Connector

Connector : **PWRCON**

Type : onboard 4-pin Wafer connector



Pin	Description
1	+5V
2	GND
3	GND
4	+12V

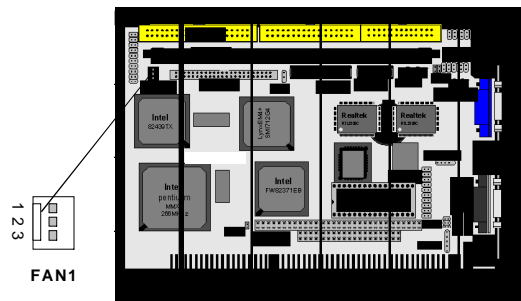
---

## System Fan Connector

Connector : **FAN1**

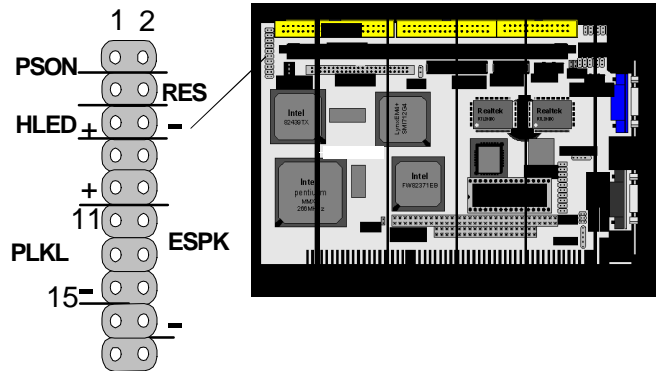
Type : onboard 3-pin wafer connector

Pin	Description
1	GND
2	+12V
3	NC





## Switches and Indicators

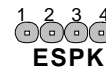


Connector : **JFRT1**  
Type : onboard 17-pin header

Pin	Jumper	Description
1-2	PSON	ATX soft power switch
3-4	RES	reset function
5-6	HLED	Hard Disk LED
12,14,16,18	ESPK	external speaker
11,13,15	PLKL	power LED

### PLKL and ESPK Connector

Connector : **PLKL**  
Power LED can be indicated when the CPU card is on or off. A keyboard lock can be used to disable the keyboard function so the PC will not respond by any input.

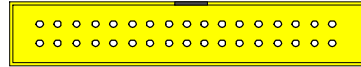


PLKL		ESPK	
Pin	Description	Pin	Description
11	LED power	12	Speak +
13	NC	14	GND
15	GND	16	NC
		18	Speak -

---

## Interface Connectors HDD, FDD

### Floppy Disk Drive (FDD1)



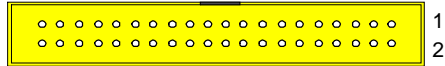
1  
2

Connector : **FDD1**  
Type : Onboard 34-pin box header

Pin	Description	Pin	Description
1	GND	2	DRIVE DENSITY SELECT 0
3	GND	4	NC
5	GND	6	DRIVE DENSITY SELECT 1
7	GND	8	INDEX-
9	GND	10	MOTOR ENABLE A-
11	GND	12	DRIVER SELECT B-
13	GND	14	DRIVER SELECT A-
15	GND	16	MOTOR ENABLE B-
17	GND	18	DIRECTION-
19	GND	20	STEP-
21	GND	22	WRITE DATA-
23	GND	24	WRITE GATE-
25	GND	26	TRACK 0-
27	GND	28	WRITE PROTECT-
29	GND	30	READ DATA-
31	GND	32	HEAD SELECT-
33	GND	34	DISK CHANGE-

---

Enhanced IDE  
Connector



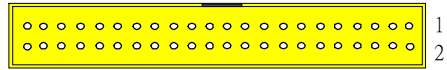
Connector : **IDE1**

Type : One onboard 40-pin box header (IDE1)

Pin	Description	Pin	Description
1	#RESET	2	GND
3	D7	4	D8
5	D6	6	D9
7	D5	8	D10
9	D4	10	D11
11	D3	12	D12
13	D2	14	D13
15	D1	16	D14
17	D0	18	D15
19	GND	20	NC/(Vcc)
21	REQ	22	GND
23	#OW	24	GND
25	#OR	26	GND
27	#ORDY	28	IDESEL
29	#DACK	30	GND
31	IRQ	32	NC
33	ADDR1	34	CBLID
35	ADDR0	36	ADDR2
37	#CS0	38	#CS1(#HD SELET1)
39	#ACT	40	GND

---

Enhanced IDE  
Connector



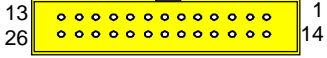
Connector : **IDE2**

Type : One onboard 44-pin box headers, primary IDE

Pin	Description	Pin	Description
1	#RESET	2	GND
3	D7	4	D8
5	D6	6	D9
7	D5	8	D10
9	D4	10	D11
11	D3	12	D12
13	D2	14	D13
15	D1	16	D14
17	D0	18	D15
19	GND	20	NC
21	REQ	22	GND
23	#OW	24	GND
25	#OR	26	GND
27	#ORDY	28	IDESEL
29	#DACK	30	GND
31	IRQ	32	NC
33	ADDR1	34	CBLID
35	ADDR0	36	ADDR2
37	#CS0	38	#CS1(#HD SELET1)
39	#ACT	40	GND
41	Vcc	42	Vcc
43	GND	44	GND

## Peripheral Port

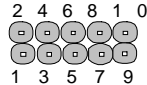
### Parallel Port



Connector : **JLPT1**  
 Type : onboard 26-pin box header

Pin	Description	Pin	Description
1	#STROBE	14	#AUTOFEED
2	DATA0	15	#ERROR
3	DATA1	16	#INITIALIZE
4	DATA2	17	#SELECT INPUT
5	DATA3	18	GND
6	DATA4	19	GND
7	DATA5	20	GND
8	DATA6	21	GND
9	DATA7	22	GND
10	#ACKNOWLEDGE	23	GND
11	BUSY	24	GND
12	PAPER EMPTY	25	GND
13	SELECT	26	GND

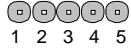
### USB Ports



Connector: **USB1**  
 Type: onboard Two 10-pin box headers for four USB ports

Pin	Description	Pin	Description
1	VCC	2	VCC
3	DATA-	4	DATA-
5	DATA+	6	DATA+
7	GND	8	GND
9	GND	10	NC

### JIR1



Connector : **SIR**  
 Type : onboard 5-pin header

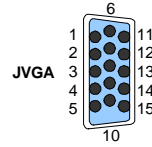
Pin	Description	Pin	Description
1	Vcc	2	NC
3	IRRX	4	GND
5	IRTX		

---

## CRT SVGA

Connector : **JVGA**

Type : external 15-pin D-sub female connector on bracket

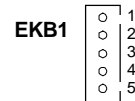


Pin	Description	Pin	Description	Pin	Description
1	RED	6	GND	11	NC
2	GREEN	7	GND	12	VDDAT
3	BLUE	8	GND	13	HSYNC
4	NC	9	Vcc	14	VSYNC
5	GND	10	GND	15	VDCLK

## AT Keyboard

Connector : **EKB1**

Type : Onboard 5-pin header



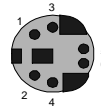
Pin	Description	Pin	Description
1	CLK	2	DATA
3	NC	4	GND
5	NC		

Note: ATKB1 doesn't provide Vcc power pin on pin-5, that is, ATKB1 cannot connect to AT keyboard directly. ATKB1 supports AT keyboard with passive backplane.

## PS/2 Keyboard & Mouse

Connector: **KBM1**

Type: external 6-pin Mini DIN connector on bracket



Pin	Description	Pin	Description
1	KB-DATA	2	MS-DATA
3	GND	4	VCC
5	KB-CLK	6	MS-CLK

Note: KB1 supports PS/2 keyboard directly, and PS/2 mouse supported with the additional PS2 1-to-2 cable in the standard packing.

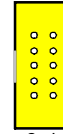
---

## COM2 for RS-232C/422/485 Port

Connector : **COM2**

Type : onboard 10-pin box header

**COM2**



Pin	Description	Pin	Description
1	DCD	2	RXD
3	TXD	4	DTR
5	GND	6	DSR
7	RTS	8	CTS
9	RI	10	NC

## COM2 Port with RS-422 Mode

Connector : **COM2**

Type : onboard 10-pin box header

### RS-422 Mode

Pin	Description	Pin	Description
1	TX+	2	TX-
3	NC	4	NC
5	NC	6	NC
7	NC	8	RX+
9	RX-	10	NC

## COM2 Port with RS-485 Mode

Connector : **COM2**

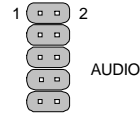
Type : onboard 10-pin box header

### RS-485 Mode

Pin	Description	Pin	Description
1	DATA+	2	DATA-
3	NC	4	NC
5	NC	6	NC
7	NC	8	NC
9	NC	10	NC

### Audio Interface Port (AUDIO1)

Connector : **AUDIO1**  
 Type : onboard 10-pin header



Pin	Description	Pin	Description
1	LINE-L	2	LINE-R
3	GND	4	GND
5	MIC	6	NC
7	GND	8	GND
9	LOUT-L	10	LOUT-R

### CDROM audio interface (CD\_IN1)

Connector : **CD\_IN1**  
 Type : onboard 4-pin boxheader

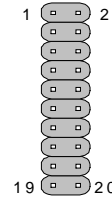


Pin	Description	Pin	Description
1	CD Left	2	GND
3	GND	4	CD Right

### 16-bit General Purpose I/O (GPIO1)

Connector : **GPIO1**  
 Type : Onboard 20-pin header

Output Port I/O Based Address : 208hex~20Fh; Pin1~Pin8  
 Input Port I/O Based Address : 200hex~207h; Pin11~Pin18



Digital Output

Digital Input

Logic Level 0: 0.5V (max)

Logic Level 0: 0.8V (max)

Logic Level 1: 2.0V (min)

Logic Level 1: 2.0V (min)

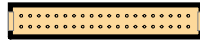
Output Current per pin:  $\pm 25$ mA (max)

Pin	Description	Pin	Description
1	DO0	2	DO1
3	DO2	4	DO3
5	DO4	6	DO5
7	DO6	8	DO7
9	GND	10	GND
11	DI0	12	DI1
13	DI2	14	DI3
15	DI4	16	DI5
17	DI6	18	DI7
19	+5V	20	+12V

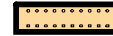


---

## LCD Interface Connector



LCD1



LCD2

Connector : **LCD1 and LCD2**

Type : Onboard DF13 40-pin & DF13 20-pin box headers

### LCD1 pin Assignment

Pin	Description	Pin	Description
1	5V	2	5V
3	Ground	4	Ground
5	3V	6	3V
7	VEEP	8	Ground
9	FP0	10	FP1
11	FP2	12	FP3
13	FP4	14	FP5
15	FP6	16	FP7
17	FP8	18	FP9
19	FP10	20	FP11
21	FP12	22	FP13
23	FP14	24	FP15
25	FP16	26	FP17
27	FP18	28	FP19
29	FP20	30	FP21
31	FP22	32	FP23
33	Ground	34	Ground
35	FPCLK	36	FP
37	M	318	LP
39	FPVDEN	40	VBIASEN

---

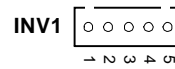
LCD2 pin Assignment

Pin	Description	Pin	Description
1	Ground	2	Ground
3	FP24	4	FP25
5	FP26	6	FP27
7	FP28	8	FP29
9	FP30	10	FP31
11	FP32	12	FP33
13	FP34	14	FP35
15	Ground	16	Ground
17	NC	18	NC
19	NC	20	NC

LCD Invertor Connector (INV1)

Connector : **INV1**

Type : onboard 6-pin header



Pin	Description	Pin	Description
1	12V	2	GND
3	FPEN	4	VEEP
5	GND		

---

## Watchdog Timer

### Watchdog Output

The onboard watchdog timer can be disabled by jumper setting or enabled for either reboot by system RESET. The Jumper is on the carrier board.

Even if enabled by jumper setting upon boot the watchdog timer is always inactive. To initialize or refresh the watchdog timer writing of port 444H is sufficient. To disable the watchdog timer read port 44H.

Status	Action
Enable/refresh the Watchdog Timer	I/O Write 444H
Disable the Watchdog Timer.	I/O Read 044H

After the watchdog timer has been initialized by reading port 444H, it has to be strobed at preconfigured intervals to keep it from issuing a RESET or NMI.

The watchdog timer timeout intervals are set by software programming.

### Timeout Values

Timeout values are programmed. The watchdog timer supports 255 steps. Use the table on the next page to find the hexadecimal value that needs to be passed on to get the correct timer interval. Look subsequently at the program example how to pass the value to the watchdog timer.

### Timeout Table

Level	Value	Seconds	Level	Value	Seconds	Level	Value	Seconds
1	1	1	2	2	2	3	3	3
4	4	4	5	5	5	6	6	6
7	7	7	8	8	8	9	9	9
10	A	10	11	B	11	12	C	12
13	D	13	14	E	14	15	F	15
16	10	16	17	11	17	18	12	18
19	13	19	20	14	20	21	15	21

---

22	16	22	23	17	23	24	18	24
25	19	25	26	1A	26	27	1B	27
28	1C	28	29	1D	29	30	1E	30
31	1F	31	32	20	32	33	21	33
34	22	34	35	23	35	36	24	36
37	25	37	38	26	38	39	27	39
40	28	40	41	29	41	42	2A	42
43	2B	43	44	2C	44	45	2D	45
46	2E	46	47	2F	47	48	30	48
49	31	49	50	32	50	51	33	51
52	34	52	53	35	53	54	36	54
55	37	55	56	38	56	57	39	57
58	3A	58	59	3B	59	60	3C	60
61	3D	61	62	3E	62	63	3F	63
64	40	64	65	41	65	66	42	66
67	43	67	68	44	68	69	45	69
70	46	70	71	47	71	72	48	72
73	49	73	74	4A	74	75	4B	75
76	4C	76	77	4D	77	78	4E	78
79	4F	79	80	50	80	81	51	81
82	52	82	83	53	83	84	54	84
85	55	85	86	56	86	87	57	87
88	58	88	89	59	89	90	5A	90
91	5B	91	92	5C	92	93	5D	93
94	5E	94	95	5F	95	96	60	96
97	61	97	98	62	98	99	63	99
100	64	100	101	65	101	102	66	102
103	67	103	104	68	104	105	69	105
106	6A	106	107	6B	107	108	6C	108
109	6D	109	110	6E	110	111	6F	111
112	70	112	113	71	113	114	72	114
115	73	115	116	74	116	117	75	117
118	76	118	119	77	119	120	78	120
121	79	121	122	7A	122	123	7B	123
124	7C	124	125	7D	125	126	7E	126
127	7F	127						

---

## Programming Example

The following program is an examples of how to enable, disable and refresh the Watchdog timer:

```
WDT_EN_RF      equ      444H

WDT_DISequ     044h

WT_Enable      push AX          ; Save AX,DX
               push DX
               mov DX,WDT_EN_RF  ; Enable Timer
               mov AX,INTERVAL ; Set Timeout Value
               out DX,AX
               pop DX           ; Restore DX,AX
               pop AX
               ret

WT_Refresh     push AX          ; Save AX,DX
               push DX
               mov DX,WDT_EN_RF  ; Refresh Timer
               mov AX,INTERVAL ; Set Timeout Value
               out DX,AX
               pop DX           ; Restore DX,AX
               pop AX
               ret

WT_Disable     push AX          ; Save AX,DX
               push DX
               mov DX,WDT_DIS    ; Disable Timer
               in  AX,DX
               pop DX           ; Restore DX,AX
               pop AX
               ret

WT_Disable     push AX          ; save AX,DX
               push DX
               mov DX,WDT_DIS    ; Disable Timer
               in  AX,DX
               pop DX           ; restore DX,AX
               pop AX
               ret
```

---

## System Resources

### *Interrupt Assignment*

<b>IRQ Address</b>	<b>Description</b>
0	System Timer
1	Keyboard (or PS/2 Keyboard)
2	Programmable Interrupt Controller
3	Serial Port 2 (COM2)
4	Serial Port 1 (COM1)
5	Realtek RTL8139 & IRQ Holder for PCI Steering
6	Floppy controller
7	Parallel Port 1
8	Real-Time Clock
9	SCI IRQ used by ACPI bus
10	Realtek RTL8139 & IRQ Holder for PCI IRQ Steering
11	Intel 82371EB & ACPI IRQ Holder for PCI IRQ Steering
12	PS/2 Mouse
13	Numeric data processor
14	Intel 82371AB/EB & Primary IDE Controller
15	Secondary IDE Controller

### *I/O Address Space*

<b>Adress</b>	<b>Description</b>
0000 - 000F	DMA Controller
0020 - 0021	PIE
0040 - 0043	System Timer
0060 - 0060	Keyboard
0061 - 0061	Systems Speaker
0064 - 0064	Keyboard
0070 - 0071	System CMOS / Real time clock

---

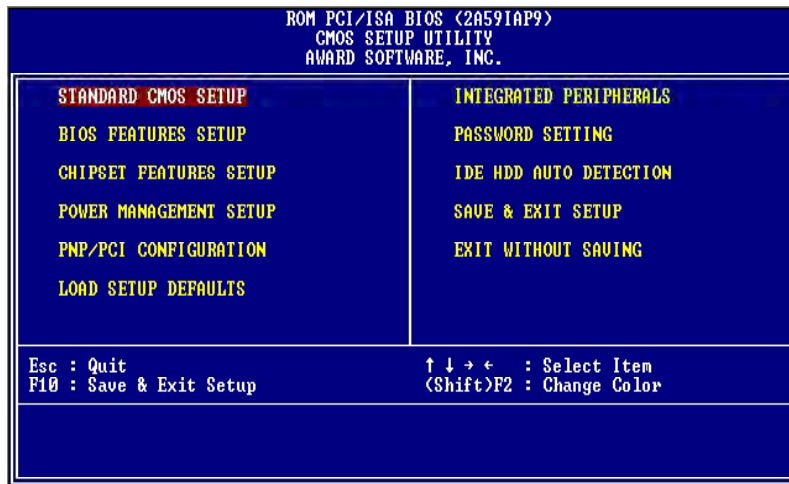
0081 - 0091	DMA Controller
00A0 - 00A1	PIC
00C0 - 00DF	DMA Controller
00F0 - 00FF	Numeric Data Processor
0170 - 0177	Seoncdary IDE Channel / Intel 82371AB/EB
01F0 - 01F7	Primary IDE Channel
02F8 - 02FF	COM2
0376 - 0376	Seoncdary IDE Channel
0378 - 037F	Printer Port
03B0 - 03BB	Silicon Motion LynxEM+
03C0 - 03DF	Silicon Motion LynxEM+
03F2 - 03F5	Floppy Disk Controller
03F6 - 03F6	Primary IDE Channel
03F7 - 03F7	Floppy Disk Controller / Intel 82371AB/EB
03F8 - 03FF	COM1
0480 - 04BF	PCI Bus
04D0 - 04D1	PCI Bus
0CF8 - 0CFF	PCI Bus
0D00 - 0FFF	PCI bus
4000 - 403F	PCI Bus
5000 - 501F	PCI Bus
E000 - E01F	Intel 82371AB/EB PCI to USB universal Host Controller
E400 - E4FF	Realtek RTL8139/810X Family Fast Ethernet NIC
E800 - E8FF	Realtek RTL8139/810X Family Fast Ethernet NIC
F000 - F00F	Intel 82371AB/EB PCI Bus Master IDE Controller
F000 - F007	Primary IDE controller (dual fifo)
F008 - F00F	Secondary IDE controller (dual fifo)

---

## AWARD BIOS Setup

The SBC uses the Award PCI/ISA BIOS ver 4.51 for the system configuration. The Award BIOS setup program is designed to provide the maximum flexibility in configuring the system by offering various options which could be selected for end-user requirements. This chapter is written to assist you in the proper usage of these features.

To access AWARD PCI/ISA BIOS Setup program, press <Del> key. The Main Menu will be displayed at this time.



Once you enter the AwardBIOS™ CMOS Setup Utility, the Main Menu will appear on the screen. The Main Menu allows you to select from several setup functions and two exit choices. Use the arrow keys to select among the items and press <Enter> to accept and enter the sub-menu.



---

## Setup Items

The main menu includes the following main setup categories. Recall that some systems may not include all entries.

### **Standard CMOS Setup**

Use this menu for basic system configuration.

### **BIOS Features Setup**

Use this menu to set the Advanced Features available on your system.

### **Chipset Features Setup**

Use this menu to change the values in the chipset registers and optimize your system's performance.

### **Power Management Setup**

Use this menu to specify your settings for power management.

### **PnP / PCI Configuration**

This entry appears if your system supports PnP / PCI.

### **Load Setup Defaults**

Use this menu to load the BIOS default values that are factory settings for optimal performance system operations. While Award has designed the custom BIOS to maximize performance, the factory has the right to change these defaults to meet their needs.

### **Integrated Peripherals**

Use this menu to specify your settings for integrated peripherals.

### **Password Setting**

Use this menu to set User and Supervisor Passwords.

### **IDE HDD Auto Detection**

Automatically detect and configure IDE hard disk parameters.

### **Save & Exit Setup**

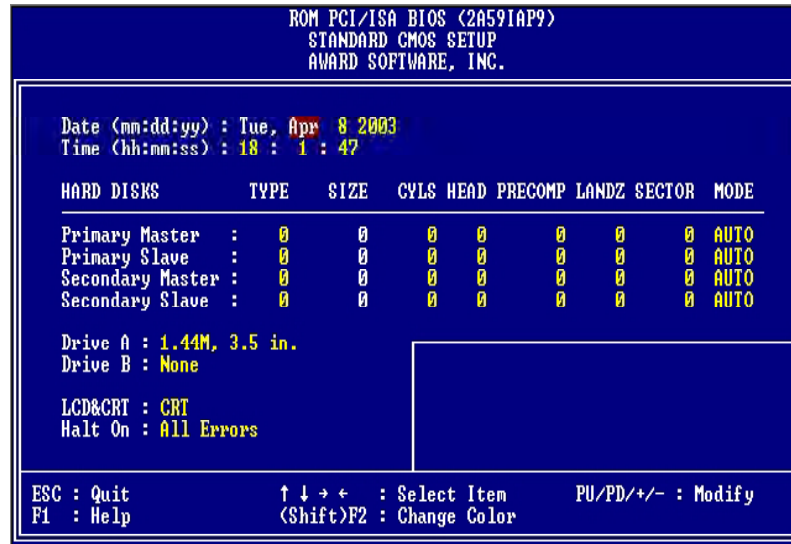
Save CMOS value changes to CMOS and exit setup.

### **Exit Without Saving**

Abandon all CMOS value changes and exit setup.

---

## Standard CMOS Setup



↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help  
F5:Previous Values F6:Fail-Safe Defaults F7:Optimized Defaults

### Date

The BIOS determines the day of the week from the other date information; this field is for information only.

### Time

The time format is based on the 24-hour military-time clock. For example, 1 p.m. is 13:00:00. Press the « or ( key to move to the desired field. Press the PgUp or PgDn key to increment the setting, or type the desired value into the field.

### IDE Primary & Secondary Master/Slave

Options are in sub menu (see page 29)

### Drive A, B

Select the correct specifications for the diskette drive(s) installed in the computer.

<b>None</b> :	No diskette drive installed
<b>360K</b> ;	5.25 in 5-1/4 inch PC-type standard drive
<b>1.2M</b> ;	5.25 in 5-1/4 inch AT-type high-density drive
<b>720K</b> ;	3.5 in 3-1/2 inch double-sided drive
<b>1.44M</b> ;	3.5 in 3-1/2 inch double-sided drive
<b>2.88M</b> ;	3.5 in 3-1/2 inch double-sided drive

---

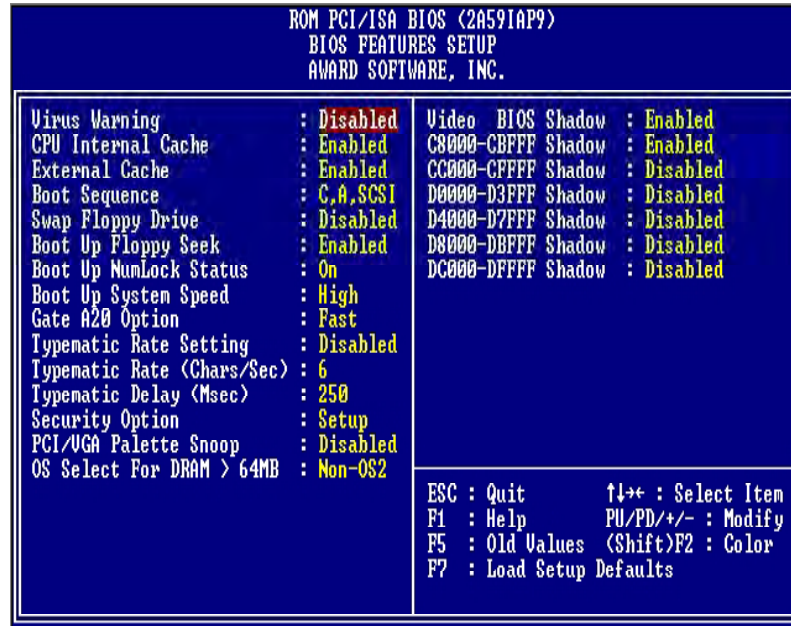
**LCD&CRT** Select the type of primary video subsystem in your computer. The BIOS usually detects the correct video type automatically. The BIOS supports a secondary video subsystem, but you do not select it in Setup.

**Halt On** During the power-on self-test (POST), the computer stops if the BIOS detects a hardware error. You can tell the BIOS to ignore certain errors during POST and continue the boot-up process. These are the selections:

No errors	POST does not stop for any errors.
All errors	If the BIOS detects any non-fatal error, POST stops and prompts you to take corrective action.
All, But Keyboard	POST does not stop for a keyboard error, but stops for all other errors.
All, But Diskette	POST does not stop for diskette drive errors, but stops for all other errors.
All, But Disk/Key	POST does not stop for a keyboard or disk error, but stops for all other errors.

---

## BIOS Features Setup



↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help  
F5:Previous Values F6:Fail-Safe Defaults F7:Optimized Defaults

### Virus Warning

Allows you to choose the VIRUS Warning feature for IDE Hard Disk boot sector protection. If this function is enabled and someone attempt to write data into this area, BIOS will show a warning message on screen and beep.

Enabled Activates 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 will appear when anything attempts to access the boot sector or hard disk partition table.

---

### **CPU Internal Cache/ External Cache**

Cache memory is additional memory that is much faster than conventional DRAM (system memory). CPUs from 486-type on up contain internal cache memory, and most, but not all, modern PCs have additional (external) cache memory. When the CPU requests data, the system transfers the requested data from the main DRAM into cache memory, for even faster access by the CPU. The external Cache field may not appear if your system does not have external cache memory.

### **Boot Sequence**

The BIOS attempts to load the operating system from the devices in the sequence selected in these items. The choices are : Floppy, LS/ZIP, HDD, SCSI, CDROM, USB FDD, USB ZIP, USB CD, USB HD, Disabled.

### **Swap Floppy Drive**

If the system has two floppy drives, you can swap the logical drive name assignments. The choice: Enabled/Disabled.

### **Boot Up Floppy Seek**

Seeks disk drives during boot up. Disabling speeds boot up.  
The choice: Enabled/Disabled.

### **Boot Up NumLock Status**

Select power on state for NumLock. The choice: Enabled/Disabled.

### **Gate A20 Option**

Select if chipset or keyboard controller should control GateA20.  
Normal A pin in the keyboard controller controls GateA20  
Fast Lets chipset control GateA20

### **Typematic Rate Setting**

Key strokes repeat at a rate determined by the keyboard controller. When enabled, the typematic rate and typematic delay can be selected.  
The choice: Enabled/Disabled.

### **Typematic Rate (Chars/Sec)**

Sets the number of times a second to repeat a key stroke when you hold the key down. The choice: 6, 8, 10, 12, 15, 20, 24, 30.

### **Typematic Delay (Msec)**

Sets the delay time after the key is held down before it begins to repeat the keystroke. The choice: 250, 500, 750, 1000.

### **Security Option**

Select whether the password is required every time the system boots or only when you enter setup.

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

Setup The system will boot, but access to Setup will be denied if the correct

---

password is not entered at the prompt.

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

**PCI/VGA Palette Snoop**

Normally this option is always Disabled! Nonstandard VGA display adapters such as overlay cards or MPEG video cards may not show colors properly. Setting Enabled should correct this problem. If this field set Enabled, any I/O access on the ISA bus to the VGA card's palette registers will be reflected on the PCI bus. This will allow overlay cards to adapt to the changing palette colors.

**OS Select For DRAM > 64MB**

Select the operating system that is running with greater than 64MB of RAM on the system. The choice: Non-OS2, OS2.

---

## Chipset Features Setup

ROM PCI/ISA BIOS (2A591AP9)			
CHIPSET FEATURES SETUP			
AWARD SOFTWARE, INC.			
Auto Configuration	: Enabled	DRAM Refresh Rate	: 15.6 us
DRAM Timing	: 70ns	EEPROM Write Protect	: Enabled
DRAM Leadoff Timing	: 10/6/3		
DRAM Read Burst (EDO/FP)	: x222/x333		
DRAM Write Burst Timing	: x222		
Fast EDO Lead Off	: Disabled		
Refresh RAS# Assertion	: 4 Clks		
Fast RAS To CAS Delay	: 3		
DRAM Page Idle Timer	: 2 Clks		
DRAM Enhanced Paging	: Enabled		
Fast MA to RAS# Delay	: 2 Clks		
SDRAM(CAS Lat/RAS-to-CAS)	: 3/3		
SDRAM Speculative Read	: Disabled		
System BIOS Cacheable	: Enabled		
Video BIOS Cacheable	: Enabled		
8 Bit I/O Recovery Time	: 1	ESC : Quit	↑↓←→ : Select Item
16 Bit I/O Recovery Time	: 2	F1 : Help	PU/PD/+/- : Modify
Memory Hole At 15M-16M	: Disabled	F5 : Old Values	(Shift)F2 : Color
PCI 2.1 Compliance	: Disabled	F7 : Load Setup Defaults	

### Auto Configuration

Auto Configuration selects predetermined optimal values of chipset parameters. When Disabled, chipset parameters revert to setup information stored in CMOS. Many fields in this screen are not available when Auto Configuration is Enabled.

### DRAM Timing

The value in this field depends on performance parameters of the installed memory chips (DRAM). Do not change the value from the factory setting unless you install new memory that has a different performance rating than the original DRAMs.

### DRAM Leadoff Timing

Select the combination of CPU clocks the DRAM on your board requires before each read from or write to the memory. Changing the value from the setting determined by the board designer for the installed DRAM may cause memory errors.

### DRAM Read Burst (EDO/EP)

Sets the timing for reads from EDO (Extended Data Output) or FPM (Fast Page Mode) memory. The lower the timing numbers, the faster the system addresses memory. Selecting timing numbers lower than the installed DRAM is able to support can result in memory errors.

---

**DRAM Write Burst Timing**

Sets the timing for writes to memory. The lower the timing numbers, the faster the system addresses memory. Selecting timing numbers lower than the installed DRAM is able to support can result in memory errors.

**Fast EDO Leadoff**

Select Enabled only for EDO DRAMs in either a synchronous cache or a cacheless system. It causes a 1-HCLK pull-in for all read leadoff latencies for EDO DRAMs (i.e., page hits, page misses, and row misses). Select Disabled if any of the DRAM rows are populated with FPM DRAMs.

**Refresh RAS# Assertion**

Select the number of clock ticks RAS# is asserted for refresh cycles.

**Fast RAS# to CAS# Delay**

When DRAM is refreshed, both rows and columns are addressed spateely. This field lets you insert a timing delay between the CAS and RAS strobe signals, used when DRAM is written to, read from, or refreshed. Disabled gives faster performance; Enabled give more stable performance.

**DRAM Page Idle Timer**

Select the amount of time in HCLKs that the DRAM controller waits to close a DRAM page after the CPU becomes idle.

**DRAM Enhanced Paging**

When Enabled, the chipset keeps the page open until a page/row miss. When Disabled, the chipset uses additional information to keep the DRAM page open when the host may be "right back."

**Fast MA to RAS# Delay CLK**

The values in this field are set by the system board designer, depending on the DRAM installed. Do not change the values in this field unless you change specifications of the installed DRAM or the installed CPU.

**SDRAM (CAS Lat/RAS-to CAS)**

You can select a combination of CAS latency and RAS-to-CAS delay in HCLKs of 2/2 or 3/3. The system board designer should set the values in this field, depending on the DRAM installed. Do not change the values in this field unless you change specifications of the installed DRAM or the installed CPU.

**SDRAM Speculative Read**

The chipset can "speculate" on a DRAM read address, thus reducing read latencies. The CPU issues a read request containing the data memory address. The DRAM controller receives the request. When this field is Enabled, the controller issues the read command slightly before it has finished decoding the data address.



---

**System BIOS Cacheable**

Selecting Enabled allows caching of the system BIOS ROM at F0000h-FFFFh, resulting in better system performance. However, if any program writes to this memory area, a system error may result.

**Video BIOS Cacheable**

Select Enabled allows caching of the video BIOS, resulting in better system performance. However, if any program writes to this memory area, a system error may result.

**8/16 Bit I/O Recovery Time**

The I/O recovery mechanism adds bus clock cycles between PCI-originated I/O cycles to the ISA bus. This delay takes place because the PCI bus is so much faster than the ISA bus. These two fields let you add recovery time (in bus clock cycles) for 16-bit and 8-bit I/O.

**Memory Hole At 15M-16M**

You can reserve this area of system memory for ISA adapter ROM. When this area is reserved, it cannot be cached. The user information of peripherals that need to use this area of system memory usually discusses their memory requirement.

**PCI 2.1 Compliance**

The chipset has an embedded 32-bit posted write buffer to support delay transactions cycles. Select Enabled to support compliance with PCI specification version 2.1.

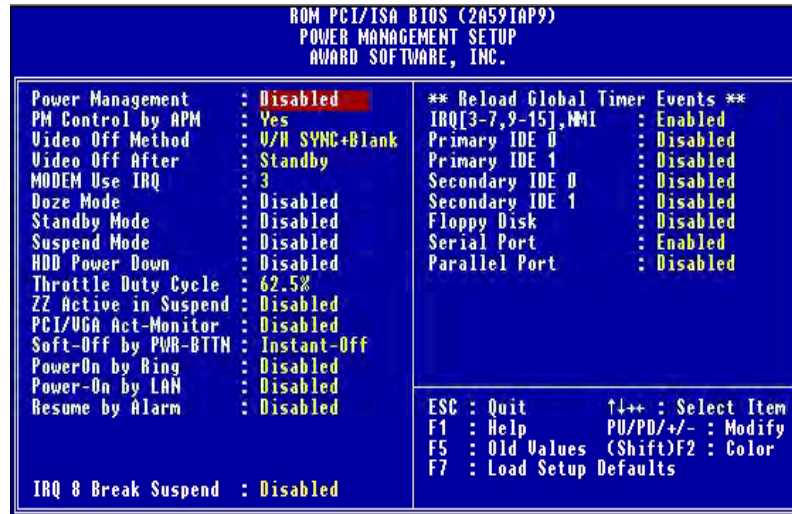
**DRAM Refresh Rate**

Select the period required to refresh the DRAMs, according to DRAM specifications.

**EEPROM Write Protect**

To access write protect on EEPROM by using "Enabled" or "Disabled".

## Power Management Setup



↑↓→←: Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help  
 F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

### Power Management

There are 4 selections for Power Management, 3 of which have fixed mode :

- |                    |  |
|--------------------|--|
| Disabled (default) | No power management. Disables all four modes.  |
| Min. Power Saving  | Minimum power management. Doze Mode = 1 hr., Standby Mode = 1 hr., Suspend Mode = 1 hr.,                                   |
| Max. Power Saving  | Maximum power management -- ONLY AVAILABLE FOR SL CPU's.. Doze Mode = 1 min., Standby Mode = 1 min., Suspend Mode = 1 min. |
| User Defined       | Allows you to set each mode individually. When not disabled, each of the ranges are from 1 min. to 1 hr.                   |

### PM Control by APM

If Advanced Power Management (APM) is installed on your system, selecting "Yes" gives better power savings.

### Video Off Method

This determines the manner in which the monitor is blanked.

- |              |   |
|--------------|---|
| Blank Screen | This option only writes blanks to the screen. |
|--------------|---|

---

DPMS	Initial display power management signaling.HDD Power Down is always set independently
V/H SYNC + Blank	System turns off vertical and horizontal synchronization ports and writes blanks to the video buffer.

**Video Off After**

As the system moves from lesser to greater power-saving modes, select the mode in which you want the monitor to blank.

**Video Off In Suspend**

Controls what causes the display to be switched off

Suspend -> Off      Always On      All Mode -> Off

**Modem Use IRQ**

Name the interrupt request (IRQ) assigned to the modem (if any) on your system. Activity of the selected IRQ always awakens the system.

**Doze Mode**

After the selected period of system inactivity (1 minute to 1 hour), the CPU clock runs at slower speed while all other devices still operate at full speed.

**Standby Mode**

After the selected period of system inactivity (1 minute to 1 hour), the fixed disk drive and the video shut off while all other devices still operate at full speed.

**HDD Power Down**

When enabled, an Advanced power Management device will be activated to enhance the Max. Power Saving mode and stop the CPU internal clock. If the Max. Power Saving is not enabled, this will be preset to No.

**Throttle Duty Cycle**

When the system enters Doze mode, the CPU clock runs only part of the time. You may select the percent of time that the clock runs.

**ZZ Active in Suspend**

When enabled, the ZZ signal is active during Suspend mode.

---

**Soft-OFF by PWR-BTTN**

The field defines the power-off mode when using an ATX power supply. The Instant-Off mode means powering off immediately when pressing the power button. In the Delay 4 Sec mode, the system powers off when the power button is pressed for more than four seconds or places the system in a very low-power-usage state, with only enough circuitry receiving power to detect power button activity or resume by ring activity when press for less than four seconds. The default is 'Instant-Off'.

**Power-ON by LAN**

There are two options can be selected: [Enabled] & [Disabled].

**Power-ON by Ring**

There are two options can be selected: [Enabled] & [Disabled].

**Resume by Alarm**

Wake Up Events

Setting an event on each device listed to awaken the system from a soft off state.

Power On by PCI Card

Wake Up on LAN/Ring

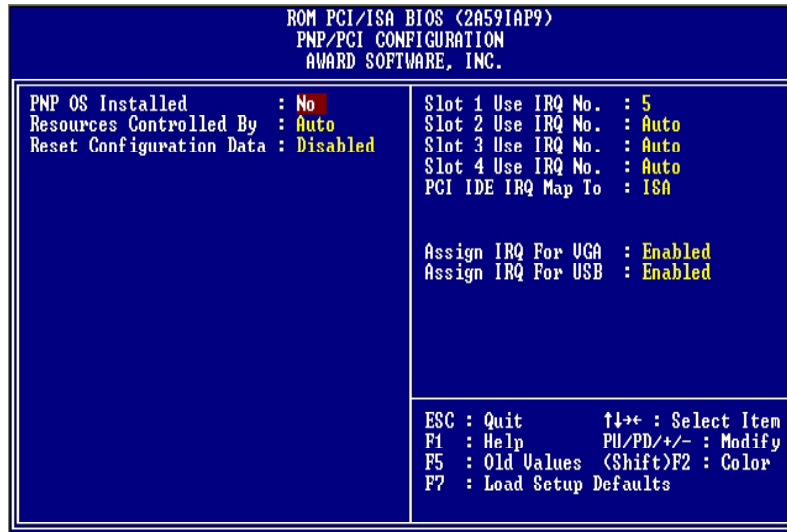
RTC Alarm Resume

Date (of Month)

Resume Time (hh:mm:ss)

---

## PnP/PCI Configuration



↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help  
F5:Previous Values F6:Fail-Safe Defaults F7:Optimized Defaults

This section describes configuring the PCI bus system. PCI, or Personal Computer Interconnect, is a system which allows I/O devices to operate at speeds nearing the speed the CPU itself uses when communicating with its own special components.

### PnP OS Installed

Select Yes if the system operating environment is Plug-and-Play aware (e.g., Windows 95).

### Reset Configuration Data

Normally, you leave this field Disabled. Select Enabled to reset ESCD (Extended System Configuration Date) when you exit Setup if you have installed a new add-on and the system reconfiguration has caused such a serious conflict that the operating system cannot boot.

### Resource Controlled By

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

---

### **IRQ Resources**

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, requiring a specific interrupt (such as IRQ4 for serial port 1).

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

### **DMA Resources**

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

Legacy ISA    Devices compliant with the original PC/AT bus specification, requiring a specific DMA channel.

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

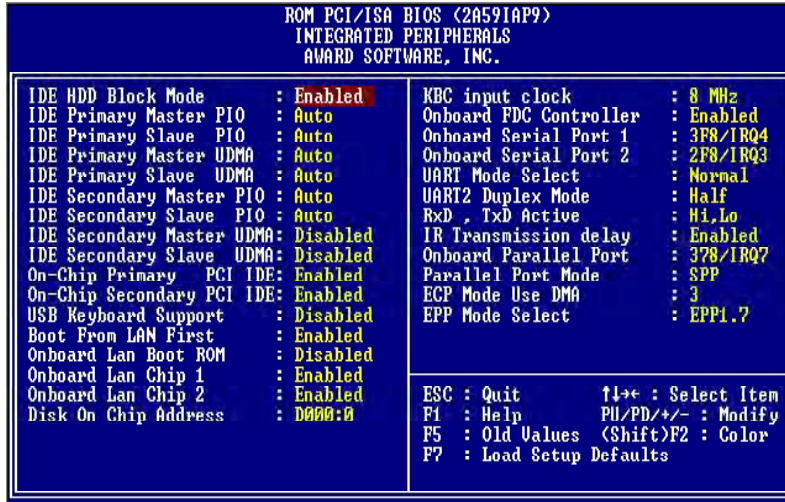
### **Assign IRQ For VGA**

Many high-end graphics accelerator cards now require an IRQ to function properly. Disabling this feature with such cards will cause improper operation and/or poor performance. Thus, it's best to make sure you enable this feature if you are having problems with your graphics accelerator card. However, some low-end cards don't need an IRQ to run normally. Check your graphics card's documentation (manual). If it states that the card does not require an IRQ, then you can disable this feature to release an IRQ for other uses. When in doubt, it's best to leave it enabled unless you really need the IRQ.

### **Assign IRQ For USB**

Windows 95 will automatically give an IRQ to the USB port even if there is no USB peripheral connected. Disabling this will free the IRQ.

## Integrated Peripherals



↑↓←→:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help  
F5:Previous Values F6:Fail-Safe Defaults F7:Optimized Defaults

### IDE HDD Block Mode

Block mode is also called block transfer, multiple commands, or multiple sector read/write. If your IDE hard drive supports block mode (most new drives do), select Enabled for automatic detection of the optimal number of block read/writes per sector the drive can support.

### Primary & Secondary Master/Slave PIO

These four PIO fields let you set a PIO mode (0-4) for each of four IDE devices that the onboard IDE interface supports. Modes 0 through 4 provide successively increased performance. In "Auto" mode, the system automatically determines the best mode for each device.

### Primary & Secondary Master/Slave UDMA

Ultra DMA/33 implementation is possible only if your IDE hard drive supports it and the operating environment includes a DMA driver (Windows 95OSR2 or a third-party IDE bus master driver). If your hard drive and your system software both support Ultra DMA/33, select "Auto" to enable BIOS support.

---

**USB Keyboard Support**

Select "Enable" if your system contains a Universal Serial Bus (USB) controller and you have USB keyboard.

**Boot From LAN First**

Select "Enabled" to activate first in LAN boot function

**Onboard Lan Boot ROM**

Select "Enabled" to activate Lan Boot ROM function

**Onboard LAN 1 / LAN 2**

This item allows to "Enabled" or "Disabled" Onboard LAN function.

**DiskOnChip Address**

This item shows the address of DiskOnChip. The default setting is d000.

**KBC Input Clock**

This feature allows you to adjust the keyboard interface clock for better response or to fix a keyboard problem. There are three selections, 8MHz, 12Mhz and 16Mhz for this feature and the default setting is 8Mhz.

**Onboard FDC Controller**

Select "Enabled" to activate the on-board FDD

Select "Disabled" to activate an add-on FDD

**Onboard Serial Port 1 & 2**

Select an address and corresponding interrupt for the first/second serial port.

The default value for the first serial port is "3F8/IRQ4" and the second serial port is "2F8/IRQ3".

**UART Mode Select**

This item allows you to select UART mode. The choices: IrDA, ASKIR, Normal.

**UR2 Duplex Mode**

This item allows you to select the IR half/full duplex function.

**RxD, TxD Active**

This item allows you to determine the active of RxD, TxD. The choices: "Hi,Hi", "Lo,Lo", "Lo,Hi", "Hi,Lo".

**IR Transmission Delay**

This item allows you to enable/disable IR transmission delay. The Choices:Enable, Disabled.



---

**Onboard Parallel Mode**

Select an operating mode for the parallel port. Mode options are 3BC/IRQ7, 378/IRQ7, 278/IRQ5, and Disable.

**Parallel Port EPP Type**

Select a EPP Type if parallel Port is set as SPP,EPP, ECP,and ECP+EPP.

**ECP Mode Use DMA**

Select a DMA channel if parallel Mode for using ECP mode: 3 or 1.

**EPP Mode Select**

Select a EPP Mode Type: EPP1.7 or EPP1.9.

---

## POST Codes

The following codes are not displayed on the screen. They can only be viewed on the LED display of a so called POST card. The codes are listed in the same order as the according functions are executed at PC startup. If you have access to a POST Card reader, you can watch the system perform each test by the value that's displayed. If the system hangs (if there's a problem) the last value displayed will give you a good idea where and what went wrong, or what's bad on the system board.

<b>CODE</b>	<b>DESCRIPTION OF CHECK</b>
CFh	Test CMOS R/W functionality.
C0h	Early chipset initialization: -Disable shadow RAM -Disable L2 cache (socket 7 or below) -Program basic chipset registers
C1h	Detect memory -Auto-detection of DRAM size, type and ECC. -Auto-detection of L2 cache (socket 7 or below)
C3h	Expand compressed BIOS code to DRAM
C5h	Call chipset hook to copy BIOS back to E000 & F000 shadow RAM.
0h1	Expand the Xgroup codes locating in physical address 1000:0
02h	Reserved
03h	Initial Superio_Early_Init switch.
04h	Reserved
05h	1. Blank out screen 2. Clear CMOS error flag
06h	Reserved
07h	1. Clear 8042 interface 2. Initialize 8042 self-test
08h	1. Test special keyboard controller for Winbond 977 series Super I/O chips. 2. Enable keyboard interface.
09h	Reserved
0Ah	1. Disable PS/2 mouse interface (optional). 2. Auto detect ports for keyboard & mouse followed by a port & interface swap (optional). 3. Reset keyboard for Winbond 977 series Super I/O chips.
0Bh	Reserved
0Ch	Reserved

---

0Dh	Reserved
0Eh	Test F00h segment shadow to see whether it is R/W-able or not. If test fails, keep beeping the speaker.
0Fh	Reserved
10h	Auto detect flash type to load appropriate flash R/W codes into the run time area in F000 for ESCD & DMI support.
11h	Reserved
12h	Use walking 1's algorithm to check out interface in CMOS circuitry. Also set real-time clock power status, and then check for override.
13h	Reserved
14h	Program chipset default values into chipset. Chipset default values are MODBINable by OEM customers.
15h	Reserved
16h	Initial onboard clock generator if Early_Init_Onboard_Generator is defined. See also POST 26h.
17h	Reserved
18h	Detect CPU information including brand, SMI type (Cyrix or Intel) and CPU level (586 or 686).
19h	Reserved
1Ah	Reserved
1Bh	Initial interrupts vector table. If no special specified, all H/W interrupts are directed to SPURIOUS_INT_HDLR & S/W interrupts to SPURIOUS_soft_HDLR.
1Ch	Reserved
1Dh	Initial EARLY_PM_INIT switch.
1Eh	Reserved
1Fh	Load keyboard matrix (notebook platform)
20h	Reserved
21h	HPM initialization (notebook platform)
22h	Reserved
23h	1. Check validity of RTC value: e.g. a value of 5Ah is an invalid value for RTC minute. 2. Load CMOS settings into BIOS stack. If CMOS checksum fails, use default value instead.
24h	Prepare BIOS resource map for PCI & PnP use. If ESCD is valid, take into consideration of the ESCD's legacy information.

---

25h	Early PCI Initialization: -Enumerate PCI bus number. -Assign memory & I/O resource -Search for a valid VGA device & VGA BIOS, and put it into C000:0
26h	1. If Early_Init_Onboard_Generator is not defined Onboard clock generator initialization. Disable respective clock resource to empty PCI & DIMM slots. 2. Init onboard PWM 3. Init onboard H/W monitor devices
27h	Initialize INT 09 buffer
28h	Reserved
29h	1. Program CPU internal MTRR (P6 & PII) for 0-640K memory address. 2. Initialize the APIC for Pentium class CPU. 3. Program early chipset according to CMOS setup. Example: onboard IDE controller. 4. Measure CPU speed.
2Ah	Reserved
2Bh	Invoke Video BIOS
2Ch	Reserved
2Dh	1. Initialize double-byte language font (Optional) 2. Put information on screen display, including Award title, CPU type, CPU speed, full screen logo.
2Eh	Reserved
2Fh	Reserved
30h	Reserved
31h	Reserved
32h	Reserved
33h	Reset keyboard if Early_Reset_KB is defined e.g. Winbond 977 series Super I/O chips. See also POST 63h.
34h	Reserved
35h	Test DMA Channel 0
36h	Reserved
37h	Test DMA Channel 1.
38h	Reserved
39h	Test DMA page registers.
3Ah	Reserved
3Bh	Reserved

---

3Ch	Test 8254
3Dh	Reserved
3Eh	Test 8259 interrupt mask bits for channel 1.
3Fh	Reserved
40h	Test 8259 interrupt mask bits for channel 2.
41h	Reserved
42h	Reserved
43h	Test 8259 functionality.
44h	Reserved
45h	Reserved
46h	Reserved
47h	Initialize EISA slot
48h	Reserved
49h	<ol style="list-style-type: none"> <li>1. Calculate total memory by testing the last double word of each 64K page.</li> <li>2. Program write allocation for AMD K5 CPU.</li> </ol>
4Ah	Reserved
4Bh	Reserved
4Ch	Reserved
4Dh	Reserved
4Eh	<ol style="list-style-type: none"> <li>1. Program MTRR of M1 CPU</li> <li>2. Initialize L2 cache for P6 class CPU &amp; program CPU with proper cacheable range.</li> <li>3. Initialize the APIC for P6 class CPU.</li> <li>4. On MP platform, adjust the cacheable range to smaller one in case the cacheable ranges between each CPU are not identical.</li> </ol>
4Fh	Reserved
50h	Initialize USB Keyboard & Mouse.
51h	Reserved
52h	Test all memory (clear all extended memory to 0)
53h	Clear password according to H/W jumper (Optional)
54h	Reserved
55h	Display number of processors (multi-processor platform)
56h	Reserved

---

57h	1. Display PnP logo 2. Early ISA PnP initialization -Assign CSN to every ISA PnP device.
58h	Reserved
59h	Initialize the combined Trend Anti-Virus code.
5Ah	Reserved
5Bh	(Optional Feature) Show message for entering AWDFLASH.EXE from FDD (optional)
5Ch	Reserved
5Dh	1. Initialize Init_Onboard_Super_IO 2. Initialize Init_Onboard_AUDIO.
5Eh	Reserved
5Fh	Reserved
60h	Okay to enter Setup utility; i.e. not until this POST stage can users enter the CMOS setup utility.
61h	Reserved
62h	Reserved
63h	Reset keyboard if Early_Reset_KB is not defined.
64h	Reserved
65h	Initialize PS/2 Mouse
66h	Reserved
67h	Prepare memory size information for function call: INT 15h ax=E820h
68h	Reserved
69h	Turn on L2 cache
6Ah	Reserved
6Bh	Program chipset registers according to items described in Setup & Auto-configuration table.
6Ch	Reserved
6Dh	1. Assign resources to all ISA PnP devices. 2. Auto assign ports to onboard COM ports if the corresponding item in Setup is set to "AUTO".
6Eh	Reserved
6Fh	1. Initialize floppy controller 2. Set up floppy related fields in 40:hardware.
70h	Reserved

---

71h	Reserved
72h	Reserved
73h	(Reserved
74h	Reserved
75h	Detect & install all IDE devices: HDD, LS120, ZIP, CDROM.....
76h	(Optional Feature) Enter AWDFLASH.EXE if: -AWDFLASH.EXE is found in floppy drive. -ALT+F2 is pressed.
77h	Detect serial ports & parallel ports.
78h	Reserved
79h	Reserved
7Ah	Detect & install co-processor
7Bh	Reserved
7Ch	Init HDD write protect.
7Dh	Reserved
7Eh	Reserved
7Fh	Switch back to text mode if full screen logo is supported. - If errors occur, report errors & wait for keys - If no errors occur or F1 key is pressed to continue : wClear EPA or customization logo.
80h	Reserved
81h	Reserved

#### **E8POST.ASM starts**

82h	1. Call chipset power management hook. 2. Recover the text fond used by EPA logo (not for full screen logo) 3. If password is set, ask for password.
83h	Save all data in stack back to CMOS
84h	Initialize ISA PnP boot devices
85h	1. USB final Initialization 2. Switch screen back to text mode
86h	Reserved
87h	NET PC: Build SYSID Structure.
88h	Reserved

---

89h	<ol style="list-style-type: none"> <li>1. Assign IRQs to PCI devices</li> <li>2. Set up ACPI table at top of the memory.</li> </ol>
8Ah	Reserved
8Bh	<ol style="list-style-type: none"> <li>1. Invoke all ISA adapter ROMs</li> <li>2. Invoke all PCI ROMs (except VGA)</li> </ol>
8Ch	Reserved
8Dh	<ol style="list-style-type: none"> <li>1. Enable/Disable Parity Check according to CMOS setup</li> <li>2. APM Initialization</li> </ol>
8Eh	Reserved
8Fh	Clear noise of IRQs
90h	Reserved
91h	Reserved
92h	Reserved
93h	Read HDD boot sector information for Trend Anti-Virus code
94h	<ol style="list-style-type: none"> <li>1. Enable L2 cache</li> <li>2. Program Daylight Saving</li> <li>3. Program boot up speed</li> <li>4. Chipset final initialization.</li> <li>5. Power management final initialization</li> <li>6. Clear screen &amp; display summary table</li> <li>7. Program K6 write allocation</li> <li>8. Program P6 class write combining</li> </ol>
95h	Update keyboard LED & typematic rate
96h	<ol style="list-style-type: none"> <li>1. Build MP table</li> <li>2. Build &amp; update ESCD</li> <li>3. Set CMOS century to 20h or 19h</li> <li>4. Load CMOS time into DOS timer tick</li> <li>5. Build MSIRQ routing table.</li> </ol>
FFh	Boot attempt (INT 19h)



---

## Howto : Flash the BIOS

To flash your BIOS you'll need

- 1) a xxxx.bin file that is a file image of the new BIOS
- 2) AWDFLASH.EXE a utility that can write the data-file into the BIOS chip.

Create a new, clean DOS 6 bootable floppy with "format a: /s".

Copy flash utility and the BIOS image file to this disk.

Turn your computer off. Insert the floppy you just created and boot the computer. As it boots up, hit the [DEL] key to enter the CMOS setup. Go to "LOAD SETUP (or BIOS) DEFAULTS," and then save and exit the setup program. Continue to boot with the floppy disk.

Type "AWDFLASH" to execute the flash utility. When prompted, enter the name of the new BIOS image and begin the flash procedure. Note: If you reboot now, you may not be able to boot again.

After the flash utility is complete, reboot the system.

### ***What to do when the Award flasher says: Insufficient memory***

1. In CMOS Chipset Features Setup, Disable Video Bios Cacheable.
2. Hit Esc, F10, Save and exit.
3. Flash the BIOS and reboot
4. Enter CMOS Chipset Features Setup, and Enable Video Bios Cacheable, hit Esc, F10, Save and reboot.

---

## What if things go wrong

if you use the wrong Flash BIOS or if the writing process gets interrupted, there is a fat chance that your computer won't boot anymore.

### ***How can you recover a corrupt BIOS ?***

**Boot-block booting** (this works only for Award BIOS)

Modern motherboards based on Award BIOS have a boot-block BIOS. This is small area of the BIOS that doesn't get overwritten when you flash a BIOS. The boot-block BIOS only has support for the floppy drive. If you have the AGP video enabled you won't see anything on the screen because the boot-block BIOS only supports an ISA videocard.

If you do not want to change your AGP video setting than proceed as follows:

The boot-block BIOS will execute an AUTOEXEC.BAT file on a bootable diskette. Copy an Award flasher & the correct BIOS \*.bin file on the floppy and execute it automatically by putting awdf flash \*.bin in the AUTOEXEC.BAT file.

#### **Solution 2: Hot-swapping**

1. Replace the corrupt chip by a working one. The working BIOS doesn't have to be written for your board, it just has to give you a chance of booting to DOS.

BIOSs for the same chipset mostly work. (Chipsets that not differ too much also mostly work. (e.g. Triton FX chipset and Triton HX chipset)

2. Boot the system to DOS (with floppy or HD)

3. Be sure that the System BIOS cacheable option in your BIOS is enabled! If so replace (while the computer is powered on) the BIOS chip with the corrupt one. This should work fine with most boards because the BIOS is shadowed in RAM.

4. Flash an appropriate BIOS to the corrupt chip and reboot.

**NOTE:** Use a flasher from MRBIOS (<http://www.mrbios.com>). Utilities that come with your motherboard often use specific BIOS-hooks. Because you have booted with a BIOS not written for your motherboard they usually don't work. The MR Flash utilities communicate directly with your Flash Rom and always work. In most cases they flash a non-MRBIOS to your BIOS chip without problems.

---

Any advice or comments about our products and service, or anything we can help you with please don't hesitate to contact with us. We will do our best to support your products, projects and business.



Address: Global American, Inc.  
17 Hampshire Drive  
Hudson, NH 03051

Telephone: Toll Free U.S. Only (800) 833-8999  
(603) 886-3900

FAX: (603) 886-4545

Website: <http://www.globalamericaninc.com>

Support: Technical Support at Global American

---