User's Manual

EmCORE-v611

3.5" form factor Embedded VIA
Eden CPU Core Module
with 128 MB SDRAM, CRT SVGA,
Dual Fast Ethernet, AC97 3D Audio,
PC/104 and Compact Flash Socket

Table of Contents

Introduction

This SBC is based on VIA Embedded System Platform which combines PC-66/ 100/133MHz FSB, DMA 33 IDE technologies and rich 4xAGP 2D/3D graphics capabilities in a single package. Its onboard Dual 10Base-T/100Base-TX Fast Ethernet, CRT /LCD display controller, with VGA / TTL / LVDS Interfaces add communication and multimedia features to its powerfull function.

The new VIA Eden Embedded System Platform will spur the further development of the emerging new generation of quiet running, low profile small factor designs that are being adopted for a myriad of connected information and entertainment systems - ranging from home entertainment devices such as Set Top Boxes, Game Consoles, Personal Video Recorders and Broadband Gateways to commercial applications such as Thin Clients, LCD Web Based Terminals, POS Terminals and Network Attached Servers.

These new designs not only leverage the fundamental strengths of the x86 platform - namely, its software resources, its Internet compatibility, its rapid product innovation cycles, its massive economies of scale, and its open architecture. They also extend the capabilities of the PC and the Internet by allowing people to connect to information and entertainment in an easier, more convenient, and more affordable way.

This board with the new generation of information and entertainment systems is already changing the way that people consume and interact with digital content. It will allow them to view it on a TV or LCD screen, listen to it on their audio system speakers, store it on a server or Personal Video Recorder so that it can be accessed at a later date, manipulate it on a home media PC, share it with their family over the home network, or send it to their freinds and relatives over the internet.

With its ultra low power, rich levels of integration, advanced multimedia capabilities and communication features, this board is an exciting opportunity for System Integrators and OEMs to develop new generation products that meet the desires and aspirations of the 21th century consumers.

Specifications

General Specifications

- **CPU** : VIA Ultra Low Power Embedded Eden processor (400 ~800 MHz) with FSB 66/100/133 MHz EBGA package.
- **Chipset** : VIA VT8606 TwisterT with Integrated Savage4 AGP 4X Graphics core and VT82C686B Super "South Bridge"
- **BIOS** : AWARD® Flash BIOS
- **Green Function** : power saving supported in BIOS. DOZE / STANDBY / SUSPEND modes, ACPI & APM
- **L1 Cache** : Integrated on CPU (64KB)
- **L2 Cache** : Integrated on CPU (64 KB)
- **DRAM Memory** : Onboard 128 SDRAM, and up to 512MB of SDRAM on SODIMM (Total of 768MB Memory)
- **Enhanced IDE with UltraDMA** : supports 1 port and up to 2 ATAPI devices, Ultra DMA transfer 33 MB/sec. One 44-pin (2.0 pitch) box header.
- **Watchdog Timer** : 127-level timer generates RESET or NMI 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** : VIA VT82C686B
- **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** : 4 onboard USB ver 1.1 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** : 10pin mini header for AT keyboard and PS2 mouse
- **Audio Chipset**: VIA VT82C686B, AC97 2.0 compliant, Multistream Direct Sound and Direct Sound 3D acceleration. (Line-in, CD Audio in, MIC in, Speaker out)

Network Interface Controller

- **Chipset** : 2 x Realtek 8139C, 10/100 Mbps (EmCORE-v611VL2/R Series)
- **Connector** : Two 10 pin onboard header

Display Controller

- **Chipset** : 4x AGP S3 Savage4 3D and S3 Savage 2000 2D engines integrated in VT8606 supports up to 32MB of Shared system memory
- **Display Type** : CRT (VGA, SVGA, XGA, SXGA) and LCD Type with TTL & LVDS interface
- **Connectors** : 16 pin onboard header
- **Resolution**: Single Channel of LVDS / 36-bit of TTL; all resolutions are supported up to 1280x1024.

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 @ 3.41 A (typical);(Low Power Embedded 533MHz and onboard 128MB SDRAM, EmCore-v611VL2/R)
- **System Monitoring and Alarm** : CPU and System temperature, system voltage and cooling fan RPM.
- **Board Dimensions** : 145mm x 102mm
- **Board Weight :** 0.18kg
- **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

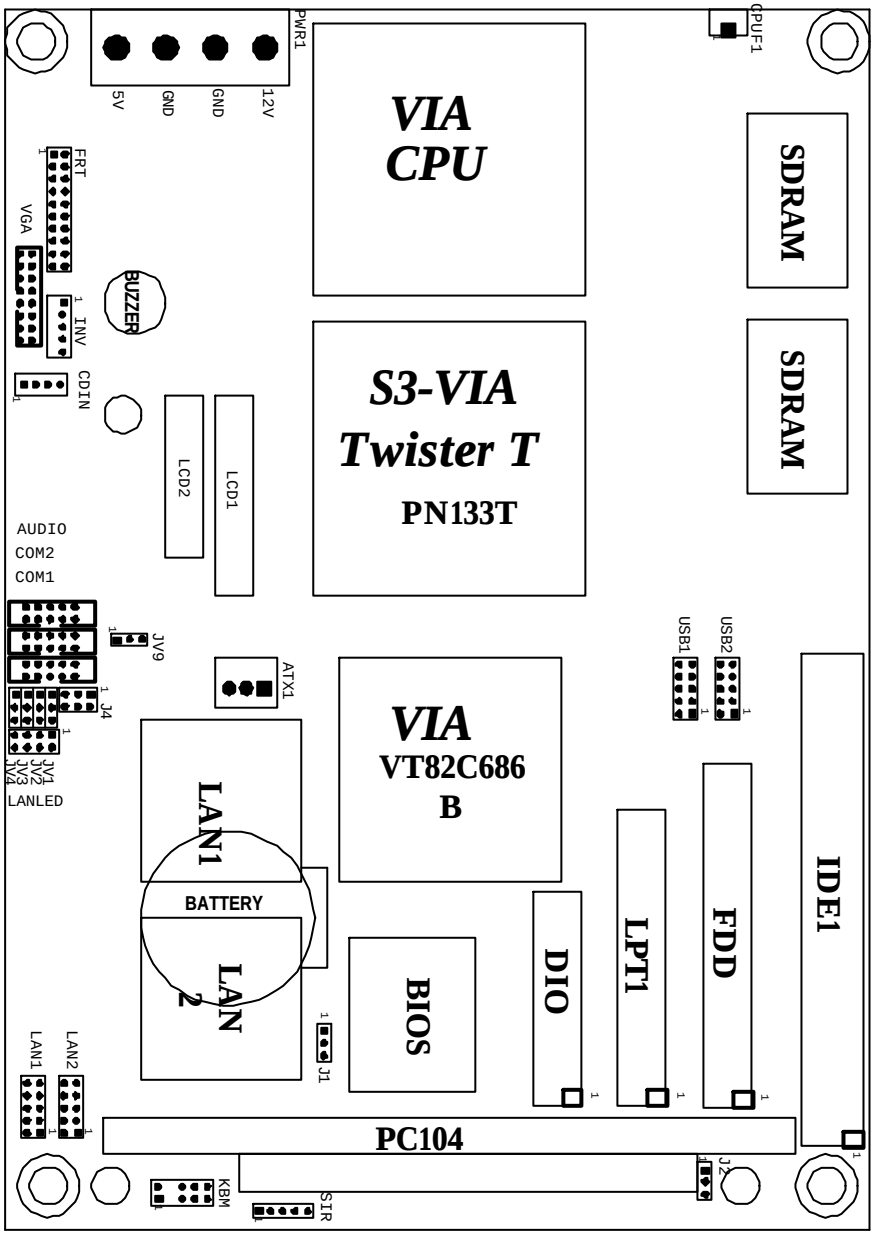
EmCORE-v611VL2R/E533 3.5" form factor Embedded VIA Eden 533MHz Single Board Computer with 128MB SDRAM, CRT SVGA, Dual Fast Ethernet, AC97 3D Audio, PC/104 and Compact Flash Socket

EmCORE-v611VL2R/E667 3.5" form factor Embedded VIA Eden 667MHz Single Board Computer with 128MB SDRAM, CRT SVGA, Dual Fast Ethernet, AC97 3D Audio, PC/104 and Compact Flash Socket (optional)

EmCORE-v611VL2R/E800 The same as above with VIA Eden 800MHz CPU (optional)

Note : Cable Kit is optional.

Board Layout Front



Jumper/Connector Quick Reference

Jumpers

Lable	Function
J1	Clear CMOS
J2	Watchdog Output
J4	RS-232 / 422 / 485 Selection
JV1~4	RS-232 Mode Selected
JV9	LCD Voltage slected

Jumper/Connector Quick Reference

Connectors

Lable	Function
ATX1	ATX Feature Connectorr
COM1	Serial Port: COM1
COM2	Serial Port: COM2
CPUF1	CPU FAN1 Connector
ESMI	External SMI
ESPK	External Speaker
FDD	Floppy Disk Driver Connector
HLED	HDD LED Connector
IDE1	Primary IDE Connector
KBM(PS2)	PS/2 Keyboard & Mouse
LAN1	10/100M LAN1 Connector
LAN2	10/100M LAN2 Connector
LANLED	LED Singal for LANs
LPT1	Parallel Port
PLKL	Power LED
PSON	ATX Soft Power Switch
DIO	16-bit GPIO
CFA1	Compact Flash Disk
PC104	ISA PC-104 Interface
LCD1	LCD Connector for TTL (under 24bit)
LCD2	LCD Connector for LVDS
INV	LCD Invertor connector
CDIN	CDROM Audio Interface
AUDIO	Audio Interface Port
SODIM1	SODIMM Socket
SIR	Infrared (IR) Connector
RES	Reset Connector
USB1	USB Port 0,1
USB2	USB Port 2,3
VGA	CRT SVGA Connector
PWR1	Power Connector

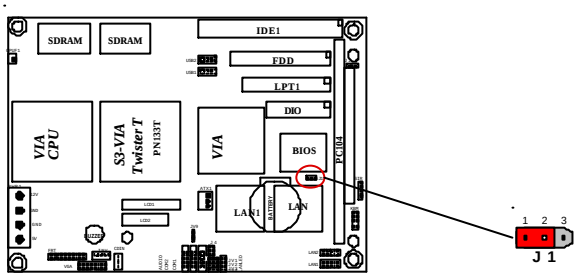
CMOS Jumper Settings

CMOS Setup (J1)

Type : J1: onboard 3-pin header

CMOS Setup (J1)	**J1**	
Keep CMOS	1-2	ON
Clear CMOS	2-3	ON

default setting



Watchdog Timer

Watchdog Output (J2)

The onboard watchdog timer can be disable by jumper setting or enable for either reboot by system RESET or invoking an NMI (Non-Maskable Interrupt)

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 time read port 44H.

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

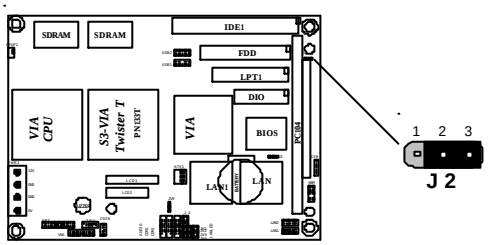
After the watchdog timer has been initialized by reading port 444H, it has to be strobed at preconfigured intervals to keep it from issuing a RESET or NMI.

The watchdog timer timeout intervals are set by software programming.

Mode Setting

Watchdog Mode	J2
Enabled for Active NMI(I/O Channel Check)	1-2
Enabled for System Reset	2-3
Disable Watchdog Timer	None

default setting



Timeout Values

Timout values are programmed. The watchdog timer supports 127 steps. use the table on the next page to find the hexidecimal value that needs to be passed on to get the correct timer interval. Look subsequntly 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	7Fh	1	2	7Eh	2	3	7Dh	3
4	7Ch	4	5	7Bh	5	6	7Ah	6
7	79h	7	8	78h	8	9	77h	9
10	76h	10	11	75h	11	12	74h	12
13	73h	13	14	72h	14	15	71h	15
16	70h	16	17	6Fh	17	18	6Eh	18
19	6Dh	19	20	6Ch	20	21	6Bh	21
22	6Ah	22	23	69h	23	24	68h	24
25	67h	25	26	66h	26	27	65h	27
28	64h	28	29	63h	29	30	62h	30
31	61h	31	32	60h	32	33	5Fh	33
34	5Eh	34	35	5Dh	35	36	5Ch	36
37	5Bh	37	38	5Ah	38	39	59h	39
40	58h	40	41	57h	41	42	56h	42
43	55h	43	44	54h	44	45	53h	45
46	52h	46	47	51h	47	48	50h	48
49	4Fh	49	50	4Eh	50	51	4Dh	51
52	4Ch	52	53	4Bh	53	54	4Ah	54
55	49h	55	56	48h	56	57	47h	57
58	46h	58	59	45h	59	60	44h	60
61	43h	61	62	42h	62	63	41h	63
64	40h	64	65	3Fh	65	66	3Eh	66
67	3Dh	67	68	3Ch	68	69	3Bh	69
70	3Ah	70	71	39h	71	72	38h	72
73	37h	73	74	36h	74	75	35h	75
76	34h	76	77	33h	77	78	32h	78
79	31h	79	80	30h	80	81	2Fh	81
82	2Eh	82	83	2Dh	83	84	2Ch	84
85	2Bh	85	86	2Ah	86	87	29h	87
88	28h	88	89	27h	89	90	26h	90
91	25h	91	92	24h	92	93	23h	93
94	22h	94	95	21h	95	96	20h	96
97	1Fh	97	98	1Eh	98	99	1Dh	99
100	1Ch	100	101	1Bh	101	102	1Ah	102
103	19h	103	104	18h	104	105	17h	105
106	16h	106	107	15h	107	108	14h	108
109	13h	109	110	12h	110	111	11h	111
112	10h	112	113	0Fh	113	114	0Eh	114
115	0Dh	115	116	0Ch	116	117	0Bh	117
118	0Ah	118	119	09h	119	120	08h	120
121	07h	121	122	06h	122	123	05h	123

124	04h	124	125	03h	125	126	02h	126
127	01h	127						

Programming Example

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

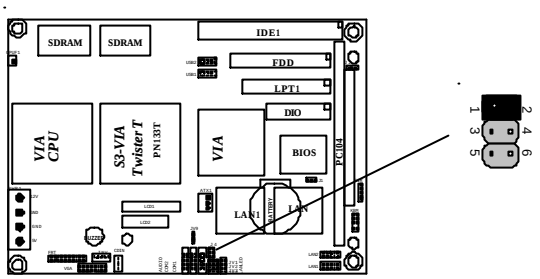
```
WDT_EN_RF       equ     444H

WDT_DIS equ     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 Timout 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
```

Serial Port Selection (RS232C/422/485)

RS-232C/422/485 Mode select (J4)

RS-232C/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 J4 switches between RS-232 or RS-422/485 mode. When J4 is set to RS-422 or 485 mode, there will be only +12V output left while J4 is set. All of the RS-232/422/485 modes are available on COM2.



COM2

Pin Defined:	RS232	RS422	RS485
Pin1 :	DCD	Tx+	RTx+
Pin2 :	RXD	Tx-	RTx-
Pin8 :	CTS	Rx+	x
Pin9 :	RI	Rx-	x

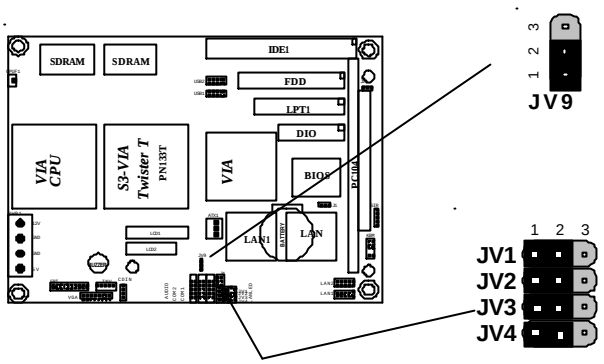
J4 Selection	**1-2**	**3-4**	**5-6**
RS-232	Close	Open	Open
RS-422	Open	Close	Open
RS-485	Open	Open	Close

default setting

Voltage select

LCD Voltage Select (JV9)

JV9	LCD Voltage
1-2 ->	3.3 V (Default setting)
2-3 ->	5 V



RS-232c Standard and POS Modes (JV1~JV4)

All onboard COM ports can be configured to operate in standard RS-232c mode or in POS (Point-of-Sale) RS-232c mode. POS devices normally need an additional power supply signal (5V or 12V) to be able to power the device (LCD, cash drawer or printer) without additional wiring.

There are three seperate POS modes :
- RS-232 with 5V on pin 1
- RS-232 with 12V on pin 9
- RS-232 with 5V on pin 1 and 12V on pin 9

COM1 RS-232 Mode	JV1	JV2
Standard	1-2	1-2
POS : 12 V on pin 9	2-3	1-2
POS : 5 V on pin 1	1-2	2-3
POS : 5 V on pin 1 and 12 V on pin 9	2-3	2-3

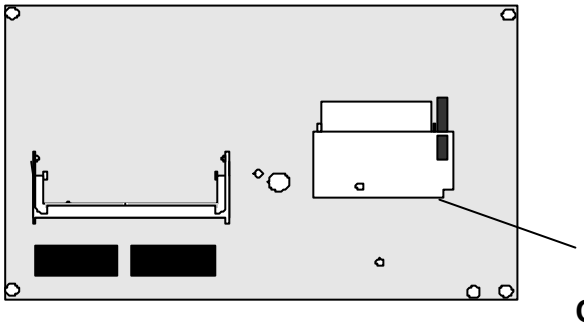
COM2 RS-232 Mode	JV3	JV4
Standard	1-2	1-2
POS : 12 V on pin 9	2-3	1-2
POS : 5 V on pin 1	1-2	2-3
POS : 5 V on pin 1 and 12 V on pin 9	2-3	2-3

Flash Disk

Compact Flash Disk

Installation Instructions

1. Make sure the Single Board Computer is powered OFF.
2. Plug the Compact Flash TypeI/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



Compact Flash

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

http:// www.pretec.com

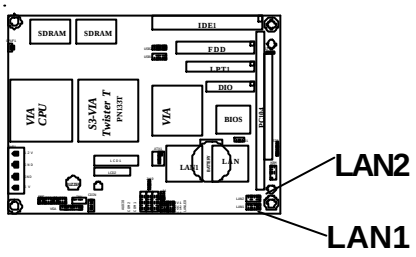
where you can find the utilities manual, data sheets and application notes. In addition, you can find the latest Compact Flash disk utilities.

Ethernet Connectors

LAN Port Signals (LAN1 & LAN2)

Connector : **LAN1 & 2**
Type : Onboard 10-pin header

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



LAN LED Connector (LANLED)

Connector: LANLED

Pin	Description
LAN1	
1-2	Link (on) Activity flash
3-4	100 (on) / 10 (off)
LAN2	
5-6	Link (on) Activity flash
7-8	100 (on) / 10 (off)

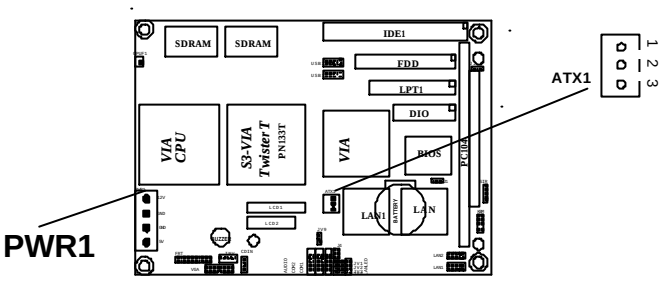
Power Connector

ATX Feature Connector

ATX Feature Connector:ATX1

Type : onboard 3-pin Wafer connector

Pin	Description
1	PS-ON
2	GND
3	5VSB



ATX Power Connector (PWR1)

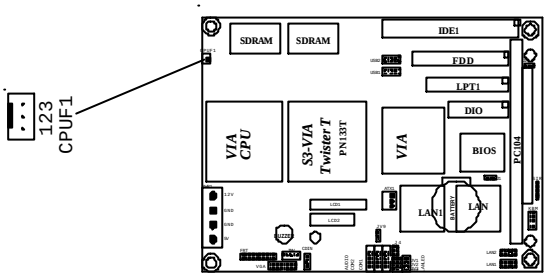
Connector : **PWR1**
Type : 4 pin

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

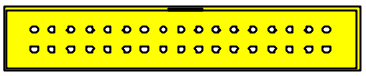
CPU Fan Connector

Connector : **CPUF1**
Type : onboard 3-pin wafer connector

Pin	Description
1	FAN_CTL
2	+5V
3	GND



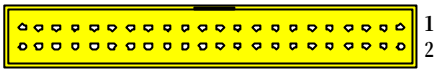
Floppy Disk Drive Connector



Connector : **FDD**
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

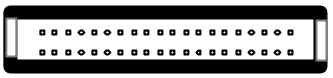


Connector : **IDE1**
Type : One onboard 44-pin box headers, primary IDE

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	#IOW	24	GND
25	#IOR	26	GND
27	#IORDY	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

Flat Panel Connector

LCD Interface Connector



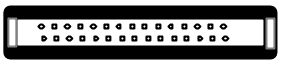
LCD1 connector is defined for TTL panel supporting 24-bit only. LCD2 connector is defined for LVDS panel for one channel and TTL panel up to 36bit (More than 24bit of TTL panel 24bit needs to use both connector LCD1 & LCD2).

Connector : **LCD1**
Type : Onboard DF13-40DS connector

LCD1 pin Assignment

Pin	Description	Pin	Description
1	LCD Power	2	Ground
3	LCD Power	4	Ground
5	Ground	6	FPD0
7	FPD1	8	FPD2
9	FPD3	10	FPD4
11	FPD5	12	FPD6
13	FPD7	14	Ground
15	Ground	16	FPD8
17	FPD9	18	FPD10
19	FPD11	20	FPD12
21	FPD13	22	FPD14
23	FPD15	24	Ground
25	Ground	26	FPD16
27	FPD17	28	FPD18
29	FPD19	30	FPD20
31	FPD21	32	FPD22
33	FPD23	34	Ground
35	Ground	36	FP_DE
37	FP_VS	38	FP_CLK
39	FP_HS	40	Ground

Connector : **LCD2**
Type : Onboard DF13-30DS connectors



LCD2 pin Assignment

1	LCD Power	2	Ground
3	LCD Power	4	YOM
5	Ground	6	YOP
7	FPD24	8	Ground
9	FPD25	10	Y1M
11	FPD26	12	Y1P
13	FPD27	14	Ground
15	FPD28	16	Y2M
17	FPD29	18	Y2P
19	FPD30	20	Ground
21	FPD31	22	YCM
23	FPD32	24	YCP
25	FPD33	26	Ground
27	FPD34	28	NC
29	FPD35	30	NC

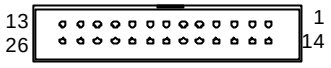
LCD Inventor Connector: INV

INV pin Assignment

Pin	Description
1	+12V
2	Ground
3	FP_ON
4	VEEP (5V)
5	Ground

Peripheral Port

Parallel Port

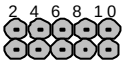


LPT1

Connector : **LPT1**
Type : onboard 26-pin box header

Pin	Description	Pin	Description
1	#STROBE	14	#AUTO FEED
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

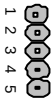


USB

Connector: **USB1, USB2**
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	GND

SIR



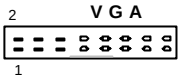
SIR

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

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

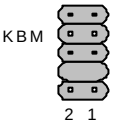
CRT SVGA

Connector : **VGA**
Type : internal 16-pin header 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
16	NC				

PS/2 Keyboard & Mouse

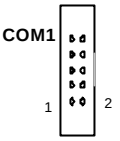


Connector: **KBM**
Type: external 6-pin Mini DIN connector on bracket

Pin	Description	Pin	Description
1	KB-DATA	2	MS-DATA
5	GND	6	GND
7	Vcc	8	Vcc
9	KB-CLK	10	MS-CLK

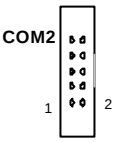
COM1 Port with RS-232C Mode

Connector : COM1
Type : onboard 10-pin box header



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-232C Mode



Connector : **COM2**
Type : onboard 10-pin box header

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-422/485 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

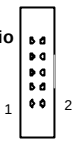
RS-485 Mode

Data+ of RS-485 is connected by pin-1

Data- of RS-485 is connected by pin-2

Audio Interface Port (AUDIO)

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



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

CDROM audio interface (CDIN)

Connector : **CDIN**
Type : onboard 4-pin boxheader

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

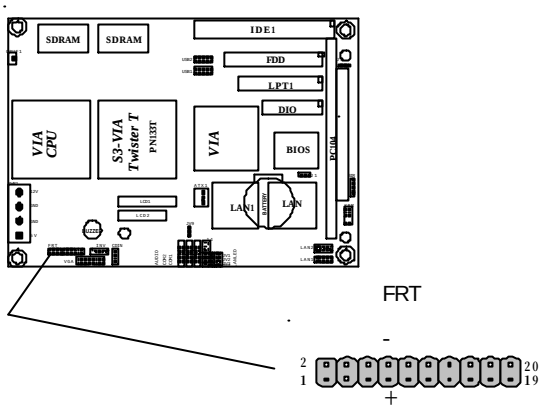
16-bit General Purpose I/O (DIO)

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

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

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

Switches and Indicators



Connector : **FRT**
Type : onboard 20-pin header

Pin	Jumper	Description
1-2	PSON	ATX soft power switch
3-4	RES	reset function
5-6	ESMI	external SMI
7-8	HLED	Hard Disk LED (Pin7=HD+, Pin8=HD-)
13,15,17,19	Speak	exteranal speaker
16,18,20	PWRLED	power LED

Connector : **SPEAK**

Pin	Description
13	Speak +
15	NC
17	NC
19	Speak -

Connector : **PWRLED**

Pin	Description
16	LED -
18	NC
20	LED +

System Resources

Interrupt Assignment

IRQ Address	Description
0	System Timer
1	Keyboard (KB output buffer full)
2	Programmable Interrupt Controller
3	Serial Port 2 (COM2)
4	Serial Port 1 (COM1)
5	Resvered
6	Floppy controller
7	Parallel Port 1
8	Real-Time Clock
9	USB
10	Ethernet 1
11	Ethernet 2
12	PS/2 Mouse
13	Numeric data processor
14	Primary IDE Controller
15	Secondary IDE Controller

I/O Address Space

Adress	Description
0000 - 000F	DMA Controller
0010 - 001F	Motherboard Resources
0020 - 0021	PIC
0022 - 003F	Motherboard Resources
0040 - 0043	System Timer
0044 - 005F	Motherboard Resources
0060 - 0060	Keyboard
0061 - 0061	Systems Speaker
0062 - 0063	Motherboard Resources
0064 - 0064	Keyboard
0065 - 006F	Motherboard Resources
0070 - 0071	System CMOS / Real time clock
0072 - 0080	Motherboard Resources

0081 - 0083	DMA Controller
008F - 0091	DMA Controller
00A0 - 00A1	PIC
00A2 - 00BF	Motherboard Resources
00E0 - 00EF	Motherboard Resources
00C0 - 00DF	DMA Controller
00F0 - 00FF	Numeric Data Processor
0170 - 0177	VIA Bus Master PCI IDE Controller
01F0 - 01F7	VIA Bus Master PCI IDE Controller
02F8 - 02FF	Communications Port B
0376 - 0376	VIA Bus Master PCI IDE Controller
0378 - 037F	Printer Port
03F0 - 03F5	Floppy Disk Controller
03F6 - 03F6	Intel Ultra ATA Controller
03F7 - 03F7	Floppy Disk Controller
03F8 - 03FF	C0M1
0400 - 048F	Motherboard Resources
0480 - 048F	Motherboard Resources
04D0 - 04D1	PCI bus

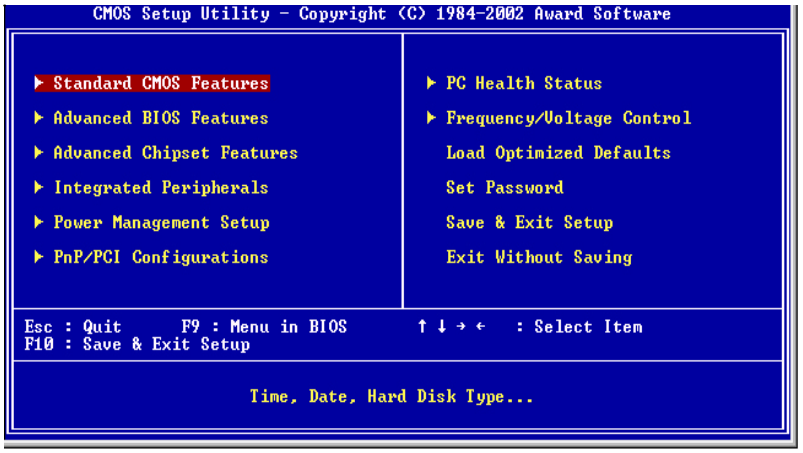
PCI Bus Map

Functino	Device ID	INT#	GNT#
LAN1	AD19	INTB	GNT0
LAN2	AD20	INTC	GNT1

AWARD BIOS Setup

The SBC uses the Award PCI/ISA BIOS ver 6.0 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 Features
Use this menu for basic system configuration.

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

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

Integrated Peripherals
Use this menu to specify your settings for integrated peripherals.

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.

PC Health Status
This entry appears CPU temperature for the systeml.

Frequency/Voltage Control
Use this menu to specify your settings for frequency/voltage control.

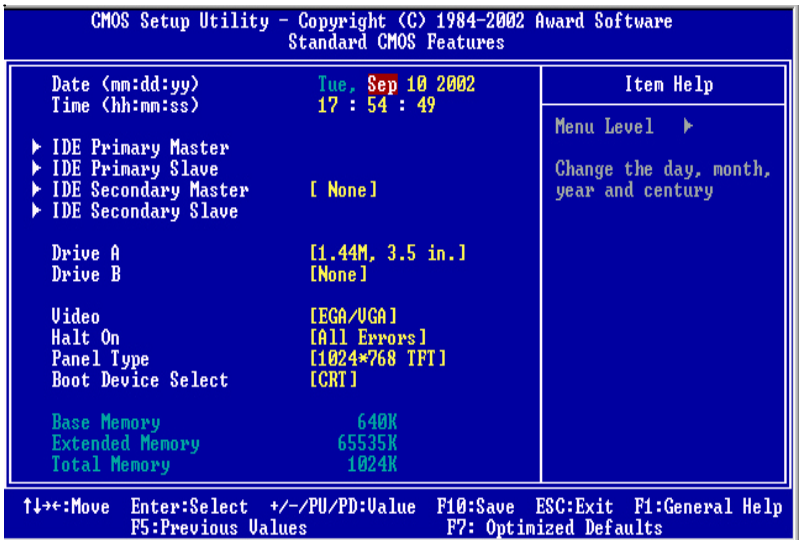
Load Optimized Defaults
Use this menu to load the BIOS default values that are factory settings for optimal performance system operations. While Award has designed the custom BIOS to maximize performance, the factory has the right to change these defaults to meet their needs.

Set Password
Use this menu to set User and Supervisor Passwords.

Save & Exit Setup
Save CMOS value changes to CMOS and exit setup.

Exit Without Save
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 Master/Slave
IDE Secondary Master/Slave
Options are in sub menu (see page 30)

Drive A, B
Select the correct specifications for the diskette drive(s) installed in the computer.

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

Video 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.

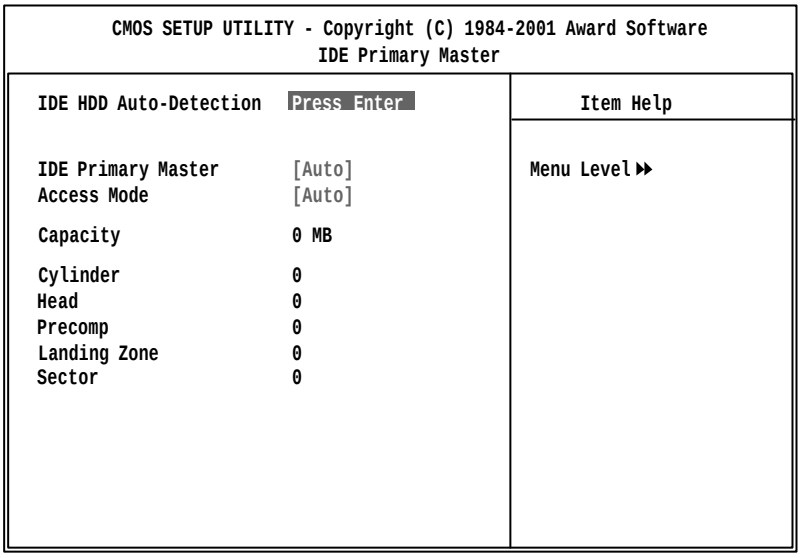
Halt On During the power-on self-test (POST), the computer stops if the BIOS detects a hardware error. You can tell the BIOS to ignore certain errors during POST and continue the boot-up process. These are the selections:

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.

Panel Type Select the different panel type to run the system. Four various resolutions for TFT type and two for DSTN.

Boot Device This item allows you to select the different devices for boot up function

IDE Harddisk Setup (submenu)



IDE HDD Auto-detection
Press Enter to auto-detect the HDD on this channel. If detection is successful, it fills the remaining fields on this menu.

IDE Primary Master
Selecting 'manual' lets you set the remaining fields on this screen. Selects the type of fixed disk. "User Type" will let you select the number of cylinders, heads, etc. Note: PRECOMP=65535 means NONE !

Capacity
Disk drive capacity (Approximated). Note that this size is usually slightly greater than the size of a formatted disk given by a disk checking program.

Access Mode
Normal, LBA, Large or Auto Choose the access mode for this hard disk

The following options are selectable only if the 'IDE Primary Master' item is set to 'Manual'

Cylinder Min = 0 Max = 65535
Set the number of cylinders for this hard disk.

Head Min = 0 Max = 255
Set the number of read/write heads

Precomp Min = 0 Max = 65535
**** Warning: Setting a value of 65535 means no hard disk

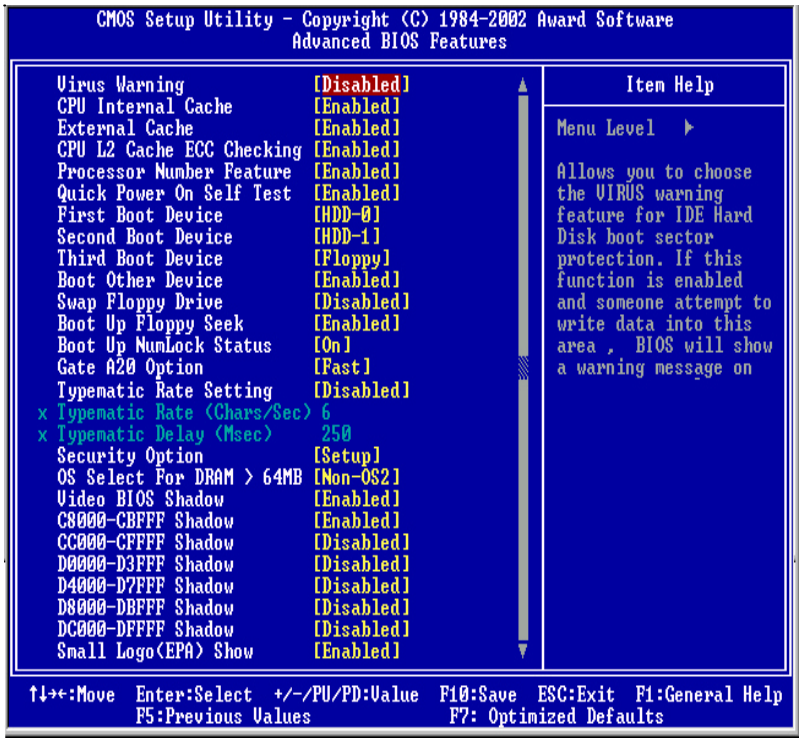
Landing zone Min = 0 Max = 65535
**** Warning: Setting a value of 65535 means no hard disk

Sector Min = 0 Max = 255
Number of sectors per track

We recommend that you select Type "AUTO" for all drives. The BIOS will auto-detect the hard disk drive and CD-ROM drive at the POST stage.

If your hard disk drive is a SCSI device, please select "None" for your hard drive setting.

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
These two categories speed up memory access. However, it depends on CPU/chipset design. Enabled : Enable cache, Disabled : Disable cache

CPU L2 Cache ECC Checking
This item allows you to enable/disable CPU L2 Cache ECC checking.
The choice: Enabled, Disabled.

Processor Number Feature
This feature appears when a a Pentium III processor is installed. It enables you enables you to control whether the Pentium III's serial number can be read by external programs. The choice : Enabled. Disabled

Quick Power On Self Test
This category speeds up Power On Self Test (POST) after you power up the computer. If it is set to Enable, BIOS will shorten or skip some check items during POST. Enabled : Enable quick POST. Disabled : Normal POST

First/Second/Third/Other Boot Device
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 Interface and 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.

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.

Video BIOS Shadow
Enabled this copies the video BIOS from ROM to RAM. effectively enhancing performance, and reducing the amount of upper memory available by 32KB (the C0000~C7FFF area of memory between 640 KB and 1 MB is used).

C8000-CBFFF Shadow
Enabling any of the C8000~CBFFF segments allows components to move their firmware into these upper memory segments. However your computer can lock-up doing so, because some devices don't like being shadowed at those particular 16 KB segments of upper memory.

Note - In Windows 95, double click 'Computer' within Device Manager and select 'Memory'. This will tell you what segments (if any) are being shadowed For DOS you can use MSD.EXE to see what segments are claimed. CC000-CFFFF - D0000-D3FFF - D4000-D7FFF - D8000-DBFFF and DC000-DFFFF - Same as above.

Chipset Features Setup

DRAM Clock
This item allows you to set the DRAM Clock. Options are Host CLK, HCLK+33M or HCLK-33M. Please set the item according to the Host (CPU) Clock and DRAM Clock.

SDRAM Cycle Length
This feature is similar to SDRAM CAS Latency Time. It controls the time delay (in clock cycles - CLKs) that passes before the SDRAM starts to carry out a read command after receiving it. This also determines the number of CLKs for the completion of the first part of a burst transfer. Thus, the lower the cycle length, the faster the transaction. However, some SDRAM cannot handle the lower cycle length and may become unstable. So, set the SDRAM Cycle Length to 2 for optimal performance if possible but increase it to 3 if your system becomes unstable.

Bank Interleave
This feature enables you to set the interleave mode of the SDRAM interface. Interleaving allows banks of SDRAM to alternate their refresh and access cycles. One bank will undergo its refresh cycle while another is being accessed. This improves performance of the SDRAM by masking the refresh time of each bank. A closer examination of interleaving will reveal that since the refresh cycles of all the SDRAM banks are staggered, this produces a kind of pipelining effect. If there are 4 banks in the system, the CPU can ideally send one data request to each of the SDRAM banks in consecutive clock cycles. This means in the first clock cycle, the CPU will send an address to Bank 0 and then send the next address to Bank 1 in the second clock cycle before sending the third and fourth addresses to Banks 2 and 3 in the third and fourth clock cycles respectively. Each SDRAM DIMM consists of either 2 banks or 4 banks. 2-bank SDRAM DIMMs use 16Mbit SDRAM chips and are usually 32MB or less in size. 4-bank SDRAM DIMMs, on the other hand, usually use 64Mbit SDRAM chips though the SDRAM density may be up to 256Mbit per chip. All SDRAM DIMMs of at least 64MB in size or greater are 4-banked in nature.

If you are using a single 2-bank SDRAM DIMM, set this feature to 2-Bank. But if you are using two 2-bank SDRAM DIMMs, you can use the 4-Bank option as well. With 4-bank SDRAM DIMMs, you can use either interleave options. Naturally, 4-bank interleave is better than 2-bank interleave so if possible, set it to 4-Bank. Use 2-Bank only if you are using a single 2-bank SDRAM DIMM. Notethat it is recommends that SDRAM bank interleaving be disabled if 16Mbit SDRAM DIMMs are used.

Memory Hole
Enabling this feature reserves 15MB to 16MB memory address space to ISA expansion cards that specifically require this setting. This makes the memory from 15MB and up unavailable to the system. Expansion cards can only access memory up to 16MB.

P2C/C2P Concurrency
When Disabled, CPU bus will be occupied during the entire PCI operation period.

System BIOS Cacheable
Allows the system BIOS to be cached for faster system performance.

Video RAM Cacheable
This item allows you to "Enabled" or "Disabled" on Video RAM Cacheable.

Frame Buffer Size
This item defines the amount of system memory that will be shared and uses as video memory.

AGP Aperture Size
Options : 4, 8, 16, 32, 64, 128, 256

This option selects the size of the AGP aperture. The aperture is a portion of the PCI memory address range dedicated as graphics memory address space. Host cycles that hit the aperture range are forwarded to the AGP without need for translation. This size also determines the maximum amount of system RAM that can be allocated to the graphics card for texture storage.

AGP Aperture size is set by the formula : maximum usable AGP memory size x 2 plus 12MB. That means that usable AGP memory size is less than half of the AGP aperture size. That's because the system needs AGP memory (uncached) plus an equal amount of write combined memory area and an additional 12MB for virtual addressing. This is address space, not physical memory used. The physical memory is allocated and released as needed only when Direct3D makes a "create non-local surface" call.

AGP-4X Mode
Set to Enabled if your AGP card supports the 4X mode, which transfers video data at 1066MB/s.

AGP Driving Control
This item is use for control AGP drive strength.
Auto: Setup AGP drive strength by default setting.
Manual: Setup AGP drive strength by manual setting.

AGP Driving Value
Key in a HEX number to control AGP output buffer drive strength.
Min = 00, Max = FF.

AGP Fast Write
To enable this function can increase VGA performance on graphic designed.

Panel Type
This item allows you to select different of Panel type.

Boot Device Select
This item allows you to select different type of devices for boot up.

OnChip USB
If your system contains a Universal Serial Bus controller and you have a USB peripheral, select Enabled. The next option will become available.

USB Keyboard Support
This item lets you enable or disable the USB keyboard driver within the onboard BIOS.

OnChip Sound
This menu can access the sound controller automaticlly

CPU to PCI Write Buffer
This controls the CPU write buffer to the PCI bus. If this buffer is disabled, the CPU writes directly to the PCI bus. Although this may seem like the faster and thus, the better method, this isn't true. Because the CPU bus is faster than the PCI bus, any CPU writes to the PCI bus has to wait until the PCI bus is ready to receive data. This prevents the CPU from doing anything else until it has completed sending the data to the PCI bus. Enabling the buffer enables the CPU to immediately write up to 4 words of data to the buffer so that it can continue on another task without waiting for those 4 words of data to reach the PCI bus. The data in the write buffer will be written to the PCI bus when the next PCI bus read cycle starts. The difference here is that it does so without stalling the CPU for the entire CPU to PCI transaction. Therefore, it's recommended that you enable the CPU to PCI write buffer.

PCI Dynamic Bursting
When enabled, data transfer on the PCI bus, where possible, make use of the high-performance PCI bust protocol, in which greater amounts of data are transferred at a single command.

PCI Master 0 WS Write
This function determines whether there's a delay before any writes to the PCI bus. If this is enabled, then writes to the PCI bus are executed immediately (with zero wait states), as soon as the PCI bus is ready to receive data. But if it is disabled, then every write transaction to the PCI bus is delayed by one wait state. Normally, it's recommended that you enable this for faster PCI performance. However, disabling it may be useful when overclocking the PCI bus results in instability. The delay will generally improve the overclockability of the PCI bus.

PCI Master 0 WS Read
This function determines whether there's a delay before any writes to the PCI bus. If this is enabled, then read to the PCI bus are executed immediately (with zero wait states), as soon as the PCI bus is ready to receive data. But if it is disabled, then every read transaction to the PCI bus is delayed by one wait state. Normally, it's recommended that you enable this for faster PCI performance. However, disabling it may be useful when overclocking the PCI bus results in instability. The delay will generally improve the overclockability of the PCI bus.

PCI Delay Transaction
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.

Delay Transaction
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.

PCI Master Read Caching
To enable this function, the CPU L2 cache will be used to cache PCI master reads. This boosts the performance of PCI master. It's recommend to disable this feature

PCI Master Broken Timer
To enable this feature allows for slower PCI bus mastering expansion cards.

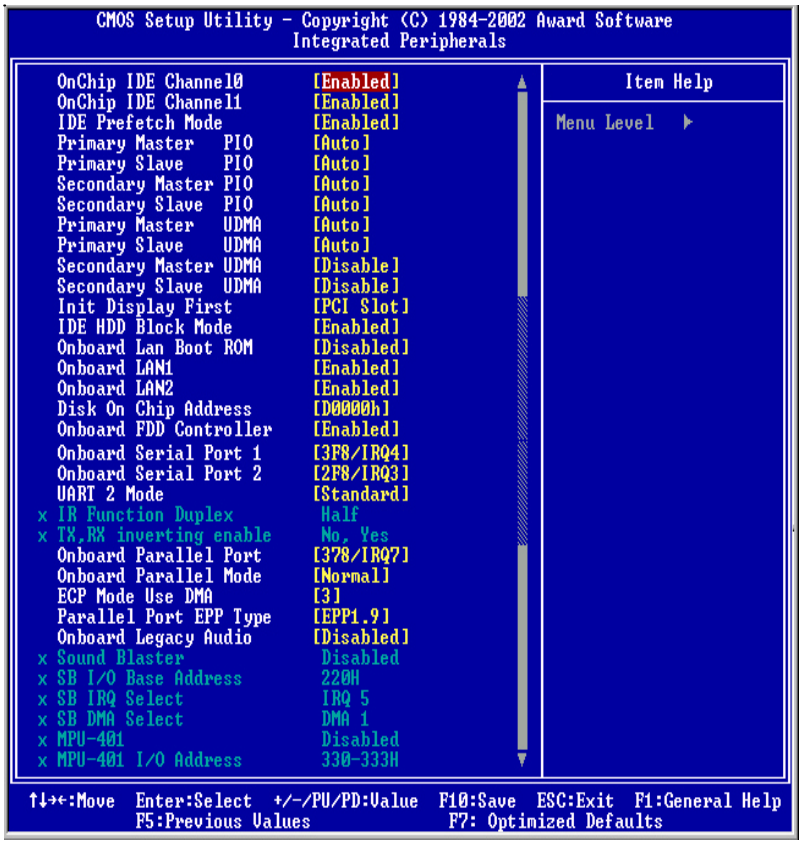
PCI # 2 Access # 1 Retry
This BIOS feature is linked to the CPU to PCI Write Buffer. Normally, the CPU to PCI Write Buffer is enabled. All writes to the PCI bus are, as such, immediately written into the buffer, instead of the PCI bus. This frees up the CPU from waiting till the PCI bus is free. The data are then written to the PCI bus when the next PCI bus cycle starts.

There's a possibility that the buffer write to the PCI bus may fail. When that happens, this BIOS option determines if the buffer write should be reattempted or sent back for arbitration. If this BIOS option is enabled, then the buffer will attempt to write to the PCI bus until successful. If disabled, the buffer will flush its contents and register the transaction as failed. The CPU will have to write again to the write buffer. It is recommended that you enable this feature unless you have many slow PCI devices in your system. In that case, disabling this feature will prevent the generation of too many retries which may severely tax the PCI bus.

ISA Bus Clock
Allows you to set the speed of the ISA bus in fractions fo the PCI bus speed, so if the PCI bus is operating at its theroretical maximum, 33Mhz, PCICLK/3 would yield an ISA speed of 11Mhz. The choices: 7.159Mhz, PCICLK/4 and PCICLK/3.

AGP Master 1 WS Write
By default, the AGP busmastering device waits for at least 2 wait states or AGP clock cycles before it starts a write transaction. This BIOS option allows you to reduce the delay to only 1 wait state or clock cycle. For better AGP write performance, enable this option but disable it if you experience weird graphical anomalies like wireframe effects and pixel artifacts after enabling this option.

AGP Master 1 WS Read
By default, the AGP busmastering device waits for at least 2 wait states or AGP clock cycles before it starts a read transaction. This BIOS option allows you to reduce the delay to only 1 wait state or clock cycle. For better AGP read performance, enable this option but disable it if you experience weird graphical anomalies like wireframe effects and pixel artifacts after enabling this option.



- ¯ ® ¬ :Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5:Previous Values F6:Fail-SAfe Defaults F7:Optimized Defaults

OnChip IDE Channel 0/1
Select "Enabled" to activate each on-board IDE channel separately, Select "Disabled", if you install an add-on IDE Control card

IDE Prefetch Mode
Enable prefetching for IDE drive interfaces that support its faster drive accesses. If you are getting disk drive errors, change the setting to omit the drive interface where the errors occur. Depending on the configuration of your IDE subsystem, this field may not appear, and it does appear when the Internal PCI/IDE filed, above, is Disabled.

Primary & Secondary Master/Slave PIO
These four PIO fields let you set a PIO mode (0-4) for each of four IDE devices. When under "Auto" mode, the system automatically set the best mode for each device

Primary & Secondary Master/Slave UDMA
When set to "Auto" mode, the system will detect if the hard drive supports Ultra DMA mode.

Init Display First
Select "AGP" or "PCI Slot" for system to detect first when boot-up.

IDE HDD Block Mode
This feature enhances disk performance by allowing multi-sector data transfers and eliminates the interrupt handling time for each sector.

Onboard LAN Boot ROM
This feature allows you to run LAN Boot function. Select "Disabled" not to access this function

Onboard LAN1
Select "Enabled" if your system contains a LAN1 port.

Onboard LAN2
Select "Enabled" if your system contains a LAN2 port.

Onboard FDD 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".

Onboard Parallel Port
Select address and interrupt for the Parallel port.

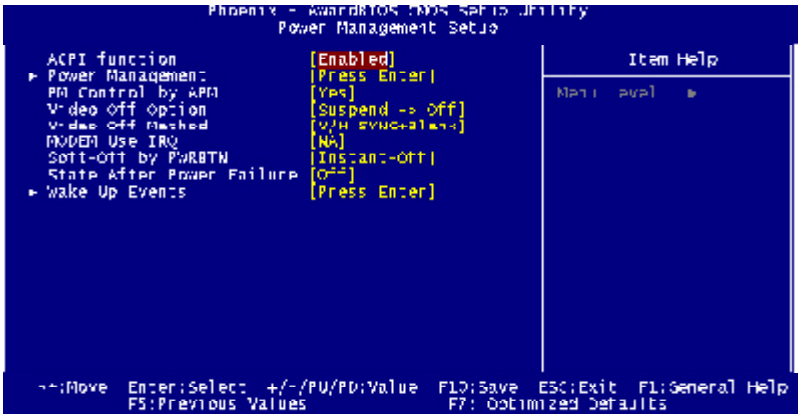
Onboard Parallel Mode
Select an operating mode for the parallel port. Mode options are Normal, EPP, ECP, ECP/EPP.

ECP Mode Use DMA
Select a DMA channel if parallel Mode is set as ECP, ECP/EPP.

Parallel Port EPP Type
Select a EPP Type if parallel Port is set as EPP, ECP/EPP.

Onboard Legacy Audio
Configuration options: Enabled and Disabled. When Enabled, select additional settings for SoundBlaster Compatibillity and MPU-401 functionallity

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

ACPI Function
Select Enabled only if your computer's operating system supports ACPI (the Advanced Configuration and Power Interface) specification. Currently, Windows 98 and Windows2000 support ACPI.

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.

HDD Power Down is always set independently

PM Control By APM
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.

Video Off Option
Controls what causes the display to be switched off
Suspend -> Off Always On All Mode -> Off

Video Off Method
This determines the manner in which the monitor is blanked.

V/H SYNC+Blank	cause the system to turn off the vertical and horizontal synchronization signals and writes blanks to the screen.
Blank Screen	This option only writes blanks to the screen.
DPMS	Initial display power management signaling.

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.

Soft-Off By PWRBTN
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'.

State After Power Failure
This item allows you to select three status after the power failure. The choices are ON, OFF and Auto.

Wake Up Events

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

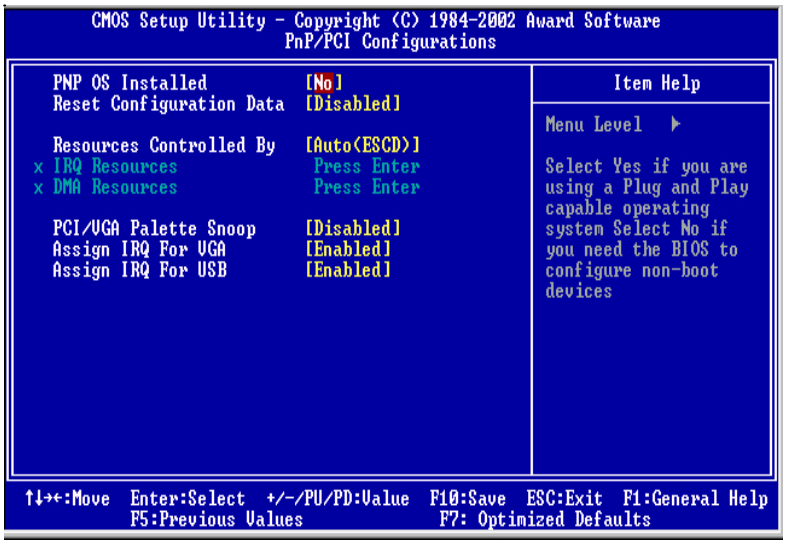
Power Button

Wake Up on LAN

Wake Up on Modem

RTC Alarm Resume

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.

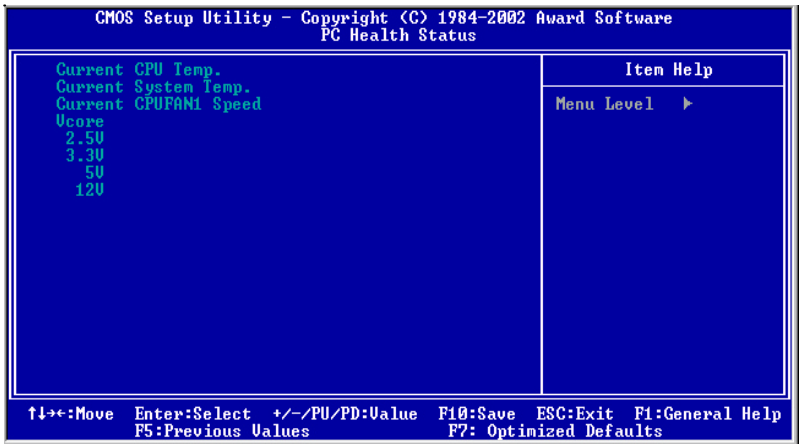
PCI/ISA PnP — Devices compliant with the Plug and Play standard, whether designed for PCI or ISA bus architecture.

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.

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.

PC Health Status



Current CPU Temperature
Show you the current CPU temperature

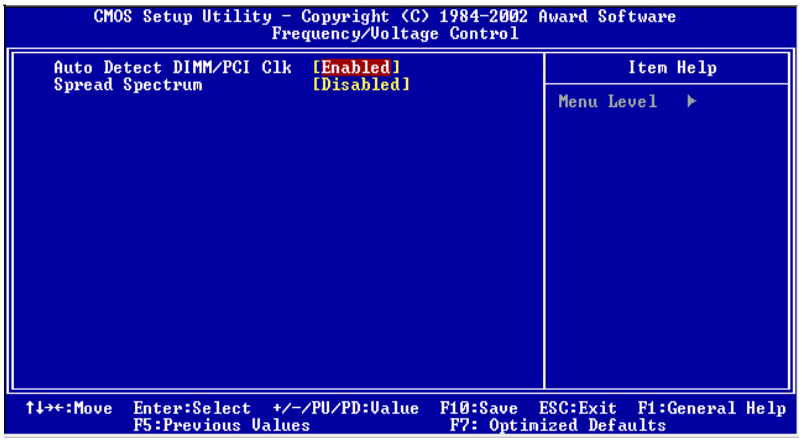
Current System Temperature
Show you the current system temperature

Current CPUFAN Speed
Show you the current CPUFAN operating speed

Vcore
Show you one type of CPU voltage

+2.5, +3.3V, +5V, +12V
Show you the different voltage can be used for the system

Frequency/Voltage Control



This section describes Frequency and Voltage control for the system.

Auto Detect DIMM/PCI CLK
When enabled, this item will auto detect if the DIMM and PCI socket have devices and will send clock signal to DIMM and PCI devices. When disabled, it will send the clock signal to all DIMM and PCI socket.

Spread Spectrum
This item allows you to enable/disable the spread spectrum modulate.

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 listened 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.

CODE	DESCRIPTION OF CHECK
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 F000h 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	1. Calculate total memory by testing the last double word of each 64K page. 2. Program write allocation for AMD K5 CPU.
4Ah	Reserved
4Bh	Reserved
4Ch	Reserved
4Dh	Reserved
4Eh	1. Program MTRR of M1 CPU 2. Initialize L2 cache for P6 class CPU & program CPU with proper cacheable range. 3. Initialize the APIC for P6 class CPU. 4. On MP platform, adjust the cacheable range to smaller one in case the cacheable ranges between each CPU are not identical.
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_Onbaord_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	1. Assign IRQs to PCI devices 2. Set up ACPI table at top of the memory.
8Ah	Reserved
8Bh	1. Invoke all ISA adapter ROMs 2. Invoke all PCI ROMs (except VGA)
8Ch	Reserved
8Dh	1. Enable/Disable Parity Check according to CMOS setup 2. APM Initialization
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	1. Enable L2 cache 2. Program Daylight Saving 3. Program boot up speed 4. Chipset final initialization. 5. Power management final initialization 6. Clear screen & display summary table 7. Program K6 write allocation 8. Program P6 class write combining
95h	Update keyboard LED & typematic rate
96h	1. Build MP table 2. Build & update ESCD 3. Set CMOS century to 20h or 19h 4. Load CMOS time into DOS timer tick 5. Build MSIRQ routing table.
FFh	Boot attempt (INT 19h)

Howto : Flash the BIOS

To flash your BIOS you'll need

1) a xxxxx.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 awdflash *.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.

Warranty

This product is warranted to be in good working order for a period of one year from the date of purchase. Should this product fail to be in good working order at any time during this period, we will, at our option, replace or repair it at no additional charge except as set forth in the following terms. This warranty does not apply to products damaged by misuse, modifications, accident or disaster.

Vendor assumes no liability for any damages, lost profits, lost savings or any other incidental or consequential damage resulting from the use, misuse of, or inability to use this product. Vendor will not be liable for any claim made by any other related party.

Return authorization must be obtained from the vendor before returned merchandise will be accepted. Authorization can be obtained by calling or faxing the vendor and requesting a Return Merchandise Authorization (RMA) number. Returned goods should always be accompanied by a clear problem description.