



**ADLINK**  
TECHNOLOGY INC.

# **NuPRO-795**

ETX PICMG 1.0

Half-Size SBC

**User's Manual**

**Manual Rev.** 2.00  
**Revision Date:** October 22, 2004  
**Part No:** 50-13047-100



Recycled Paper

***Advance Technologies; Automate the World.***



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Company Information	
Company/Organization	
Contact Person	
E-mail Address	
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TEL	FAX:
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Product Information	
Product Model	
Environment	OS: M/B: CPU: Chipset: Bios:

Please give a detailed description of the problem(s):



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# 1 Introduction

## 1.1 Product Overview

The NuPRO-795 ETX-based single board computer is comprised of the ProCB-795, a PICMG 1.0 compliant half-size carrier board, and the ETX-EV133 ETX module.

The carrier board includes common PC peripheral I/O interfaces such as serial and parallel ports, keyboard/mouse, Ethernet, IDE, VGA, and audio. It also includes an integrated debug port, hardware monitor, GPIO, and audio power amplifier and is expandable via the PCI bus.

The ETX-EV133 module is based on the VIA Eden ESP processor and VIA Apollo PLE133T and VT82C686B chipsets. The onboard SODIMM socket supports 144-pin SODIMM type memory modules and accommodates non-ECC SDRAM modules up to 512MB. The VIA Eden Processor is available from 400 MHz up to 1 GHz.

The VIA VT82C686B southbridge incorporates a PCI/ISA bridge, a VGA AGP controller, an EIDE controller supporting both PIO and UDMA modes, USB ports v1.1, two serial ports, one parallel port (SPP/ECP/EPP), one PS2 keyboard/mouse interface, AC '97 audio interface and power management functionality.

The ETX-EV133 also includes an integrated 10/100Base-T Ethernet port, a watchdog timer, and support for LVDS based flat panel displays.

## 1.2 Unpacking Checklist

Check the shipping carton for any damage. If the shipping carton and contents are damaged, notify the dealer for a replacement. Retain the shipping carton and packing materials for inspection by the dealer. Obtain authorization before returning any product to ADLINK.

Check the following items are included in the package, if there are any items missing, please contact your dealer:

Included Items
All-in-one support CD-ROM (software & manuals)
NuPRO-795 carrier board with ETX-EV133 module
Printer and COM port cable bracket
ATA-100 cables (x2)

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Note: The packaging of the NuPRO-795 OEM version with non-standard configuration, functionality, or package may vary according to different configuration requests.

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**CAUTION:** The board fitted inside the NuPRO-795 system must be protected from static discharge and physical shock. Never remove any of the socketed parts except at a static-free workstation. Use the anti-static bag shipped with the product to handle the board. Wear a wrist strap grounded through one of the system's ESD Ground jacks when servicing system components



### 1.3 Specifications

NuPRO-795 Specifications	
Carrier Board	ProCB-795
CPU	VIA Eden ESP processor (eBGA package)
System Memory	144-pin SODIMM socket for up 512 MB PC100/133 non-ECC SDRAM
Chipset	VIA Apollo PLE133T with VT8601T northbridge and VT82C686B southbridge
L2 Cache	64kB integrated in CPU

<b>NuPRO-795 Specifications</b>	
Display	Integrated AGP2X Trident Blade 2D/3D Video Accelerator (VT8601T)
	Up to 8MB UMA Video RAM
	Up to UXGA 1600 x 1200 @ 32bpp CRT
	Supports TFT on single channel LVDS (18-bit)
BIOS	AWARD 2Mb Flash BIOS with ACPI and APM 1.2 power management with console redirection and CMOS backup in onboard EEPROM
USB	Two USB ports, USB 1.1 compliant
Ethernet	Realtek RTL8139CL+ chipset, 10BaseT/100BaseTx, Wake-on LAN
Parallel Port	One high-speed parallel port, SPP/EPP/ECP mode
Serial Ports	Two high speed RS-232C ports (COM1/COM2)
Keyboard/Mouse	One PS/2 keyboard and one PS/2 mouse
Floppy Interface	Not implemented
IrDA	Supports SIR IrDA 1.1
Audio	Realtek ALC201A AC97 ver. 2.0
Watchdog Timer	128-level timer generates RESET or NMI
Dimension	122mm x 167.5mm
Power Supply	+5V, 10W typical
Operating Temp.	0 to 60°C
Humidity	0 to 90% @ 55°C
Dimensions	185.45mm x 123.12mm
Operating System	Windows 2000, XP, Linux
Vibration	Operating: 5-100Hz, 0.00142 g <sup>2</sup> /Hz; 100-500Hz ▶ 6dB/Octave; 0.5Grms, 3 axes, 30mins/axis Non-operating: 5-100Hz, 0.02g <sup>2</sup> /Hz; 100-500Hz ▶ 6dB/Octave; 1.88Grms, 3 axes, 1hr/axis (IEC 68-2-64)

## 1.4 NuPRO-795 Mechanical Drawing

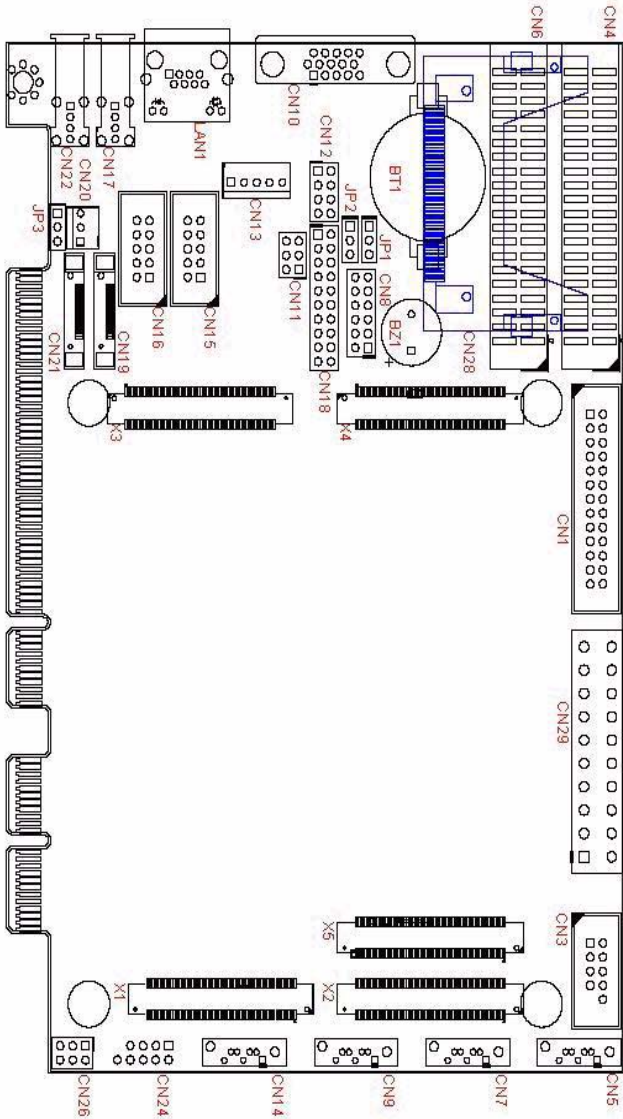


Figure 1-1: ProCB-795 Carrier Board Layout

## 1.5 ETX-EV133 Functional Diagrams

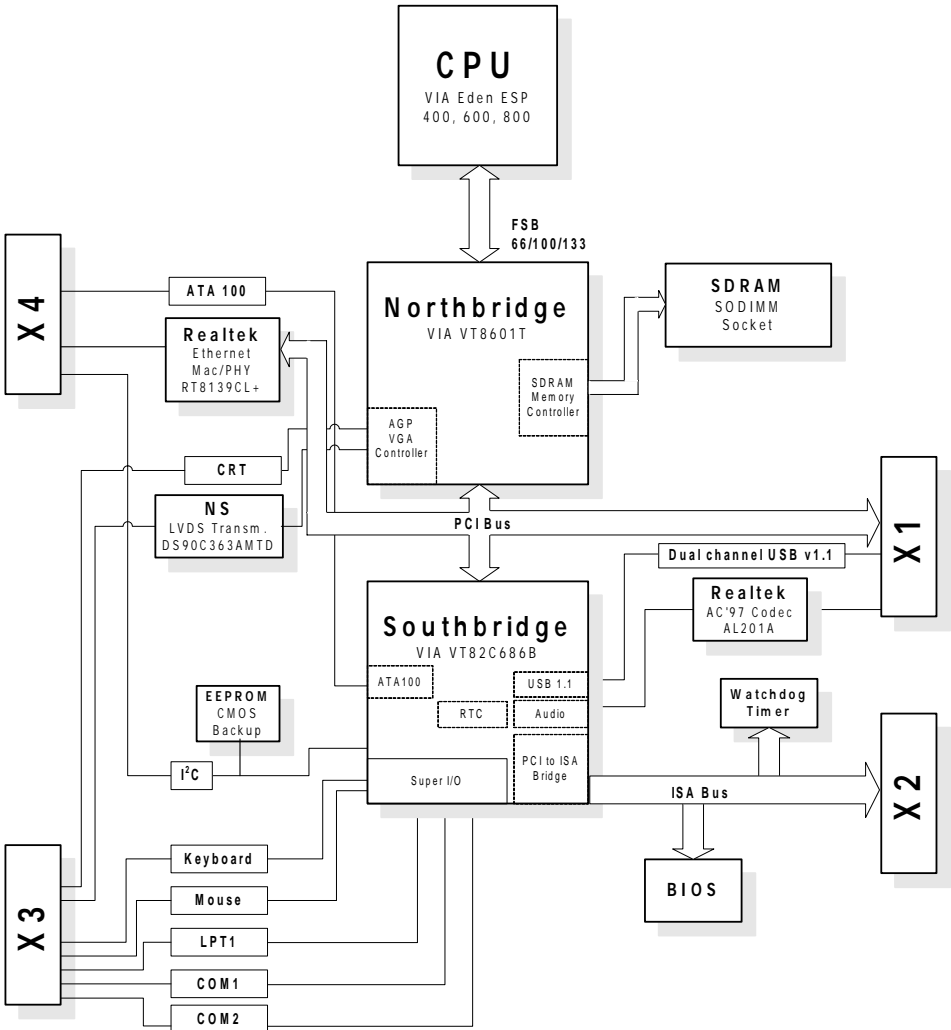
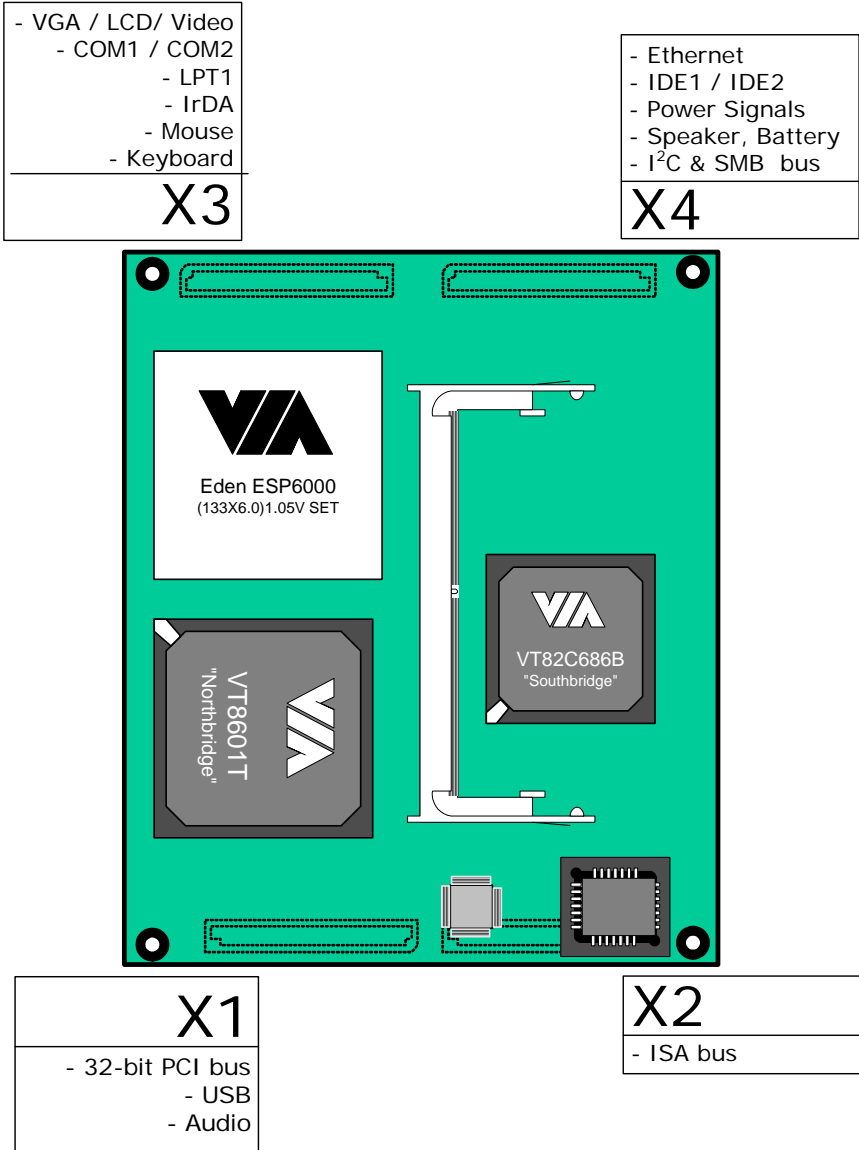


Figure 1-2: ETX-EV133 Functional Diagram



**Figure 1-3: ETX-EV133 Board/Connector Layout**

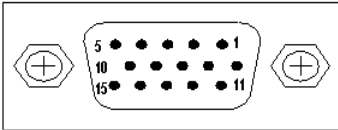
## 2 Connectors and Jumpers

This chapter will familiarize the user with the connectors and jumpers on the NuPRO-795.

### 2.1 Connector Pin Assignments

Detailed descriptions and pin-outs for each connector are given in the following section. Please refer to

#### VGA Connector (CN10)



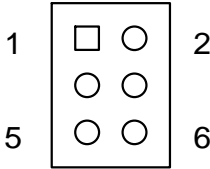
Signal Name	Pin	Pin	Signal Name
Red	1	2	Green
Blue	3	4	N.C.
GND	5	6	GND
GND	7	8	GND
+5V	9	10	GND
N.C.	11	12	DDCDAT
HSYNC	13	14	VSYNC
DDCCLK	15	—	—

#### USB Connector (CN17, CN22)



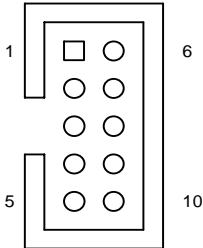
PIN	SIGNAL
1	VCC
2	USB-
3	USB+
4	Ground

## Keyboard and Mouse (CN11)



Pin	Signal Name
1	Keyboard Data
2	Keyboard Clock
3	Mouse Data
4	Mouse Clock
5	Power
6	Ground

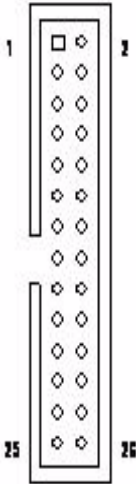
## COM Pin Header (CN15, CN16)



Pin	RS-232
1	DCD, Data carrier detect
2	RXD, Receive data
3	TXD, Transmit data
4	DTR, Data terminal ready
5	GND, ground
6	DSR, Data set ready
7	RTS, Request to send
8	CTS, Clear to send
9	RI, Ring indicator

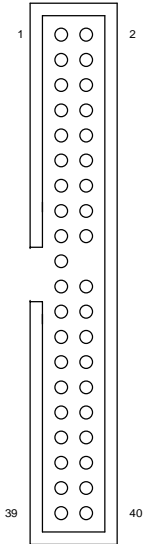


## Parallel Port (CN1)



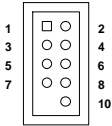
Signal Name	Pin	Pin	Signal Name
Line printer strobe	1	14	AutoFeed
PD0, parallel data 0	2	15	Error
PD1, parallel data 1	3	16	Initialize
PD2, parallel data 2	4	17	Select
PD3, parallel data 3	5	18	Ground
PD4, parallel data 4	6	19	Ground
PD5, parallel data 5	7	20	Ground
PD6, parallel data 6	8	21	Ground
PD7, parallel data 7	9	22	Ground
ACK, acknowledge	10	23	Ground
Busy	11	24	Ground
Paper empty	12	25	Ground
Select	13	N/A	N/A

## IDE (CN4, CN6)



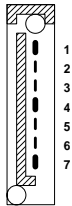
Signal Name	Pin	Pin	Signal Name
Reset IDE	1	2	GND
IDE Data 7	3	4	IDE Data 8
IDE Data 6	5	6	IDE Data 9
IDE Data 5	7	8	IDE Data 10
IDE Data 4	9	10	IDE Data 11
IDE Data 3	11	12	IDE Data 12
IDE Data 2	13	14	IDE Data 13
IDE Data 1	15	16	IDE Data 14
IDE Data 0	17	18	IDE Data 15
Ground	19	20	KEY
DREQ0	21	22	GND
IDEIOW#	23	24	GND
IDEIOR#	25	26	GND
IDEIORDY	27	28	CBSEL
DACK0#	29	30	GND
IDEIRQ14	31	32	NC
IDE Address 1	33	34	PDIAG#
IDE Address 0	35	36	IDE Address 2
IDE Chip select 1#	37	38	IDE Chip select 3#
IDE activity	39	40	GND

## USB Pin (CN3, CN24)



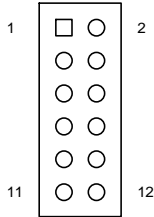
Pin	Signal Name	Signal Name	Pin
1	USB1_VCC	USB2_VCC	2
3	USB1-	USB2-	4
5	USB1+	USB2+	6
7	GND	GND	8
—	—	KEY	10

## Serial ATA Connectors (CN5, CN7, CN9, CN14)



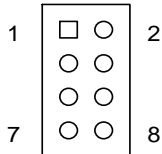
Pin	Signal Name
1	GND
2	Tx+
3	Tx-
4	GND
5	Rx-
6	Rx+
7	GND

## X4 Extension Pin Header (CN8)



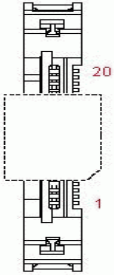
Pin	Signal Name
1	+5V
2	X4_GPE1J
3	X4_SMBLARTJ
4	X4_GPE2J
5	BATLOWJ
6	ROMKBCSJ
7	X4_RSMRSTJ
8	X4_EXTSMI
9	X1_SERIRQ
10	X4_GPCSJ
11	GND
12	X4_EXTPRG

## TV-Out Pin Header (CN12)



Pin	Signal Name
1	Y
2	GND
3	C
4	GND
5	COMP
6	GND
7	SYNC
8	GND

## LDVS Connector (CN19, CN21)



Pin	Signal Name	Pin	Signal Name
1	Panel Power	11	Txout2#
2	Panel Power	12	Txout2
3	GND	13	GND
4	GND	14	Txclk#
5	Txout0#	15	Txclk
6	Txout0	16	GND
7	GND	17	Txout3#
8	Txout1#	18	Txout3
9	Txout1	19	GND
10	GND	20	Panel Detect

## IrDA Connector (CN13)



Pin	Signal Name
1	+5V
2	No connect
3	IrRXD
4	Ground
5	IrTXD

## Miscellaneous Connector (CN18)]



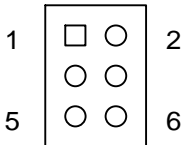
Signal Name	Pin	Pin	Signal Name
PW_LED+	1	11	BUZZER
NC	2	12	NC
PW_LED-	3	13	NC
KB_LOCK	4	14	+5V
GND	5	15	PW_GD
GND	6	16	GND
NC	7	17	HDD_LED-
PS_ON	8	18	HDD_LED+
5VSB	9	19	PW_BTN
PME#	10	20	GND

## Fan Connector (CN20)



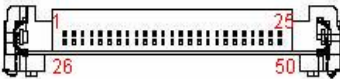
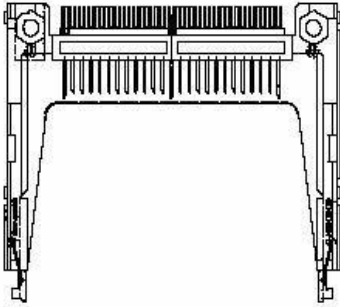
Pin	Signal Name
1	NC
2	+12V
3	GND

## Audio-Out Pin Header (CN26)



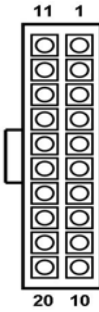
Pin	Signal Name
1	MIC In
2	ASGND
3	Line In Left
4	Line In Right
5	Line Out Left
6	Line Out Right

## Compact Flash Type I/II Connector (CN28)



Signal Name	Pin	Pin	Signal Name
GND	1	26	GND
SDD3	2	27	SDD11
SDD4	3	28	SDD12
SDD5	4	29	SDD13
SDD6	5	30	SDD14
SDD7	6	31	SDD15
SDCS#1	7	32	SDCS#3
GND	8	33	GND
GND	9	34	SDIOR#
GND	10	35	SDIOW#
GND	11	36	+5V
GND	12	37	IDEIRQ15
+5V	13	38	+5V
GND	14	39	PCSEL
GND	15	40	NC
GND	16	41	SIDERST#
GND	17	42	SIORDY
SDA2	18	43	NC
SDA1	19	44	SDDACK#
SDA0	20	45	IDEACT#
SDD0	21	46	S66DECT
SDD1	22	47	SDD8
SDD2	23	48	SDD9
IOIS16#	24	49	SDD10
GND	25	50	GND

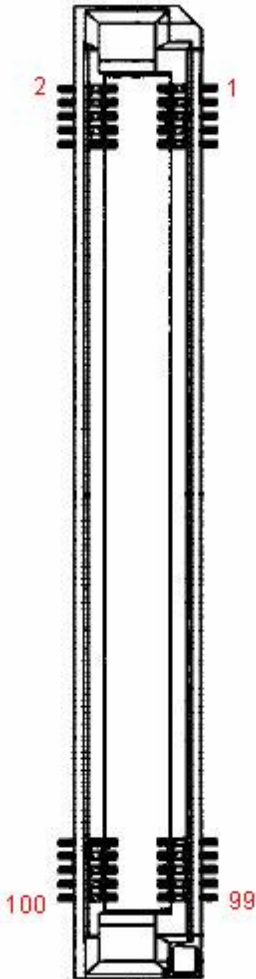
## ATX Power Connector (CN29)



Pin	Signal	Pin	Signal
1	+3.3V	11	+3.3V
2	+3.3V	12	-12V
3	GND	13	GND
4	+5V	14	PS_ON#
5	GND	15	GND
6	+5V	16	GND
7	GND	17	GND
8	PWRGOOD	18	-5V
9	STB5V	19	+5V
10	+12V	20	+5V

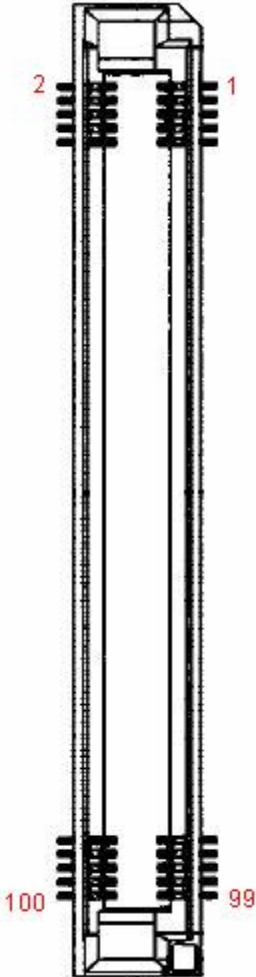


## ETX X1 Connector (PCI Bus, USB, Audio)



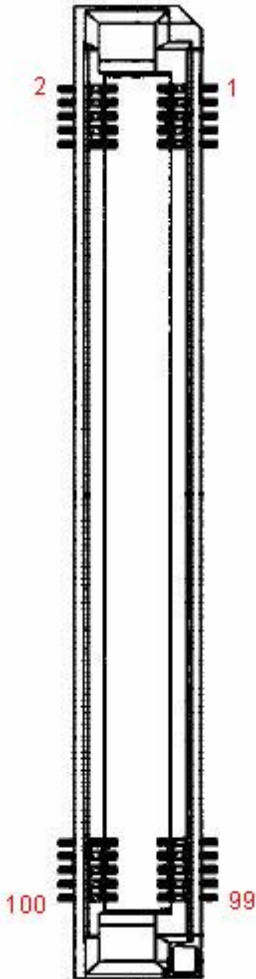
Pin	Signal Name	Pin	Signal Name
1	GND	2	GND
3	PCICLK3	4	PCICLK4
5	GND	6	GND
7	PCICLK1	8	PCICLK2
9	REQ3#	10	GNT3#
11	GNT2#	12	3V3
13	REQ2#	14	GNT1#
15	REQ1#	16	3V3
17	GNT0#	18	RESERVED
19	VCC	20	VCC
21	SERIRQ	22	REQ0#
23	AD0	24	3V3
25	AD1	26	AD2
27	AD4	28	AD3
29	AD6	30	AD5
31	C/BE0#	32	AD7
33	AD8	34	AD9
35	GND	36	GND
37	AD10	38	LINEIN_L
39	AD11	40	MICIN
41	AD12	42	LINEIN_R
43	AD13	44	AVCC
45	AD14	46	LINEOUT_L
47	AD15	48	AGND
49	C/BE1#	50	LINEOUT_R
51	VCC	52	VCC
53	PAR	54	SERR#
55	PERR#	56	RESERVED
57	PME#	58	USB2-
59	LOCK#	60	DEVSEL#
61	TRDY#	62	USB3-
63	IRDY#	64	STOP#
65	FRAME#	66	USB2+
67	GND	68	GND
69	AD16	70	C/BE2#
71	AD17	72	USB3+
73	AD19	74	AD18
75	AD20	76	USB0-
77	AD22	78	AD21
79	AD23	80	USB1-
81	AD24	82	C/BE3#
83	VCC	84	VCC
85	AD25	86	AD26
87	AD28	88	USB0+
89	AD27	90	AD29
91	AD30	92	USB1+
93	PCIRST#	94	AD31
95	INTC#	96	INTD#
97	INTA#	98	INTB#
99	GND	100	GND

## ETX X2 Connector (ISA Bus)



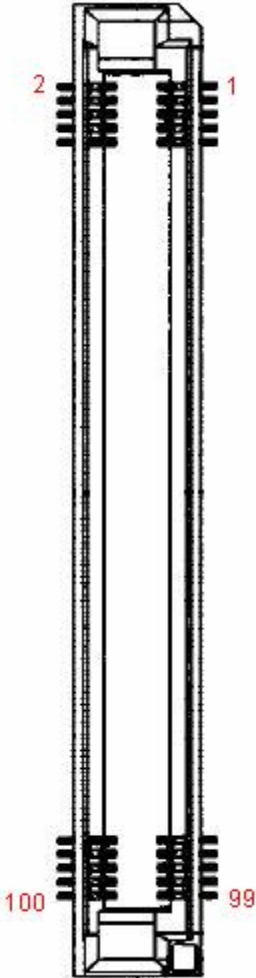
Pin	Signal Name	Pin	Signal Name
1	GND	2	GND
3	SD14	4	SD15
5	SD13	6	MASTER#
7	SD12	8	DREQ7
9	SD11	10	DACK7#
11	SD10	12	DREQ6
13	SD9	14	DACK6#
15	SD8	16	DREQ5
17	MEMW#	18	DACK5#
19	MEMR#	20	DREQ0
21	LA17	22	DACK0#
23	LA18	24	IRQ14
25	LA19	26	IRQ15
27	LA20	28	IRQ12(1)
29	LA21	30	IRQ11
31	LA22	32	IRQ10
33	LA23	34	IO16#
35	GND	36	GND
37	SBHE#	38	M16#
39	SA0	40	OSC
41	SA1	42	BALE
43	SA2	44	TC
45	SA3	46	DACK2#(2)
47	SA4	48	IRQ3
49	SA5	50	IRQ4
51	VCC	52	VCC
53	SA6	54	IRQ5
55	SA7	56	IRQ6
57	SA8	58	IRQ7
59	SA9	60	SYSCLK
61	SA10	62	REFSH#
63	SA11	64	DREQ1
65	SA12	66	DACK1#
67	GND	68	GND
69	SA13	70	DREQ3
71	SA14	72	DACK3#
73	SA15	74	IOR#
75	SA16	76	IOW#
77	SA18	78	SA17
79	SA19	80	SMEMR#
81	IOCHRDY	82	AEN
83	VCC	84	VCC
85	SD0	86	SMEMW#
87	SD2	88	SD1
89	SD3	90	NOWS#
91	DREQ2(2)	92	SD4
93	SD5	94	IRQ9
95	SD6	96	SD7
97	IOCHK#	98	RSTDRV
99	GND	100	GND

## ETX X3 Connector



Pin	Signal Name	Pin	Signal Name
1	GND	2	GND
3	RED	4	BLUE
5	HSYNC	6	GREEN
7	VSYNC	8	DDC2B_CLK
9	PAL_DETECT#	10	DDC2B_DAT
11	LCDDO16	12	LCDDO18
13	LCDDO17	14	LCDDO19
15	GND	16	GND
17	LCDDO13	18	LCDDO15
19	LCDDO12	20	LCDDO14
21	GND	22	GND
23	LCDDO8	24	LCDDO11
25	LCDDO9	26	LCDDO10
27	GND	28	GND
29	LCDDO4	30	LCDDO7
31	LCDDO5	32	LCDDO6
33	GND	34	GND
35	LCDDO1	36	LCDDO3
37	LCDDO0	38	LCDDO2
39	VCC	40	VCC
41	JILI_DAT	42	FLM
43	JILI_CLK	44	BLON#
45	BIASON	46	PLPWR_EN
47	TV_COMP	48	TV_Y
49	TV_SYNC	50	TV_C
51	LPT/FLPY#	52	RESERVED
53	VCC	54	GND
55	STB#	56	AFD#
57	RESERVED	58	PD7
59	IRRX	60	ERR#
61	IRTX	62	PD6
63	RXD2	64	INIT#
65	GND	66	GND
67	RTS2#	68	PD5
69	DTR2#	70	SLIN#
71	DCD2#	72	PD4
73	DSR2#	74	PD3
75	CTS2#	76	PD2
77	TXD2	78	PD1
79	RI2#	80	PD0
81	VCC	82	VCC
83	RXD1	84	ACK#
85	RTS1#	86	BUSY#
87	DTR1#	88	PE
89	DCD1#	90	SLCT#
91	DSR1#	92	MSCLK
93	CTS1#	94	MSDAT
95	TXD1	96	KBCLK
97	RI1#	98	KBDAT
99	GND	100	GND

## ETX X4 Connector



Pin	Signal Name	Pin	Signal Name
1	GND	2	GND
3	5V_SB	4	PWGIN
5	PS_ON	6	SPEAKER
7	PWRBTN#	8	BATT
9	KBINH	10	LILED
11	RSMRST#	12	ACTLED
13	ROMKBCS#(1)	14	SPDLED
15	EXT_PRG(1)	16	I2CLK
17	VCC	18	VCC
19	OVCR#	20	GPCS#(1)
21	EXTSMI#	22	I2DAT
23	SMBCLK	24	SMBDATA
25	SIDE_CS3#	26	SMBALRT#
27	SIDE_CS1#	28	DASP_S(1)
29	SIDE_A2	30	PIDE_CS3#
31	SIDE_A0	32	PIDE_CS1#
33	GND	34	GND
35	PDIAG_S	36	PIDE_A2
37	SIDE_A1	38	PIDE_A0
39	SIDE_INTRQ	40	PIDE_A1
41	BATLOW#	42	GPE1#
43	SIDE_ACK#	44	PIDE_INTRQ
45	SIORDY	46	PIDE_ACK#
47	SIDE_IOR#	48	PIORDY
49	VCC	50	VCC
51	SIDE_IOW#	52	PIDE_IOR#
53	SIDE_DRQ	54	PIDE_IOW#
55	SIDE_D15	56	PIDE_DRQ
57	SIDE_D0	58	PIDE_D15
59	SIDE_D14	60	PIDE_D0
61	SIDE_D1	62	PIDE_D14
63	SIDE_D13	64	PIDE_D1
65	GND	66	GND
67	SIDE_D2	68	PIDE_D13
69	SIDE_D12	70	PIDE_D2
71	SIDE_D3	72	PIDE_D12
73	SIDE_D11	74	PIDE_D3
75	SIDE_D4	76	PIDE_D11
77	SIDE_D10	78	PIDE_D4
79	SIDE_D5	80	PIDE_D10
81	VCC	82	VCC
83	SIDE_D9	84	PIDE_D5
85	SIDE_D6	86	PIDE_D9
87	SIDE_D8	88	PIDE_D6
89	GPE2#	90	CBLID_P#
91	RXD-	92	PIDE_D8
93	RXD+	94	SIDE_D7
95	TXD-	96	PIDE_D7
97	TXD+	98	HDRST#
99	GND	100	GND

## 2.2 Jumper Settings

### CF Mode Selection (JP2)



Jumper	Status
1-2	Master
2-3	Slave

### Panel Power Selection (JP3)



Jumper	Status
1-2	+5V
2-3	+3.3V



## 3 System Resources

### 3.1 Interrupt Assignments

PCI and ISA interrupts supported by the VIA VT82C686B South Bridge are as follows:

ISA IRQ	Edge/ Level	Polarity	Interrupt Source	Notes
NMI	Edge	High	SERR_L asserted	
SMI	Edge	Low	VT82C686B Hardware Monitor	
IRQ0	Edge	High	Timer0	(1)
IRQ1	Edge	High	Keyboard	
IRQ2	Edge	High	Cascade Interrupt from Slave Interrupt Controller	
IRQ3	Edge	High	COM2	(2)
IRQ4	Edge	High	COM1	(2)
IRQ5	Edge	Low	PCI PnP IRQ	
IRQ6	Edge	High	FDC	(2)
IRQ7	Edge	High	LPT1	(2)
IRQ8_L	Edge	Low	Real Time Clock	(2)
IRQ9	Edge	Low	PCI PnP IRQ	
IRQ10	Level	Low	PCI PnP IRQ	
IRQ11	Level	Low	PCI PnP IRQ, USB	(3)
IRQ12	Edge	High	Mouse	(2)
IRQ13	Edge	High	FERR_L asserted	
IRQ14	Edge	High	Primary IDE	(4)
IRQ15	Edge	High	Secondary IDE	(5)

#### Notes:

1. Internally generated by the VT82C686B.
2. Suggested. These interrupts are plug and play compatible and may be routed to any available interrupt.
3. The USB interrupt is internally routed to the PIRQD# input of the VT82C686B.
4. This interrupt is routed to the IRQ14 input of the VT82C686B.
5. This interrupt is routed to the IRQ15 input of the VT82C686B.

## 3.2 PCI Bus Arbitration Assignment

PCI Bus REQ#/GNT# (ETX Module)	Arbitor (ProCB-795)	PCI Master)	IDSEL
REQ0#/GNT0#	—	LAN8139CL+	AD23
REQ1#/GNT1#	—	PCI Slot 1	*
REQ2#/GNT2#	—	PCI Slot 2	*
REQ3#/GNT3#	—	PCI Slot 3	*
REQ4#/GNT4#	REQ5#/GNT5#	PCI Slot 4	*
	REQ6#/GNT6#	SATA Sil3114	AD19

\*Note: AD28 ~ AD31 dependent on backplane.

## 3.3 PCI Interrupt Routing

Device	Net PIRQ0_L	Net PIRQ1_L	Net PIRQ2_L	Net PIRQ3_L
PCI Slots 1-4 (Golden Fingers)	PIRQA#	PIRQB#	PIRQC#	PIRQD#
LAN 8139CL+	PIRQD#	—	—	—
SATA Sil3114	—	—	—	—



### 3.4 Memory Map

Address	Size	Description
00000000-0009FFFF	640k	DOS Application Area
000A0000-000BFFFF	128k	Video Buffer Area
000C0000-000DFFFF	1M	Expansion Area
000F0000-000FFFFF	64k	System BIOS Area
000E0000-000EFFFF	64k	Extended System BIOS Area
00100000-DRAMTop	—	System memory area
DRAM Top-FFFFRFFFF	—	Bus area
FFFEFFFF-FFFFFFFFF	64k	Initialization area

### 3.5 Direct Memory Access Channels

DMA#	Available	Description
0	Yes	—
1	Yes	Unavailable if Sound Blaster is enabled with default configuration
2	No	Used by FDC
3	Yes	Unavailable when LPT is in ECP mode
4	No	Used for Cascade
5	Yes	—
6	Yes	—
7	Yes	—

### 3.6 I/O Address Map

Address	Size	Description
0000-001F	32 bytes	Master DMA controller
0020 - 002D	14 bytes	Master Interrupt Controller
0040 - 005F	32 bytes	Timer/Counter
0060 - 006F	32 bytes	Keyboard Controller
60h	1 byte	KBC data
61h	1 byte	Misc function and Speaker control
64h	1 byte	KBC command / status
0070 - 0077	8 bytes	RTC/CMOS/NMI-Disable
0078 - 007F	8 bytes	Available for system use
0080	1 byte	Reserved (Debug port)
0081 - 008F	16 bytes	DMA page registers
0090-0091	2 bytes	Available for system use
0092	1 byte	System Control
0093 - 009F	13 bytes	Available for system use
00A0-00BF	32 bytes	Slave Interrupt Controller
00C0-00DF	32 bytes	Slave DMA Controller
00E0-00FF	32 bytes	Available for system use
0100-0CF7		Available for system use
0CF8 -0CFB	4 bytes	PCI configuration address
0CFC - 0CFF	4 bytes	PCI configuration data
0D00 - FFFF	—	Available for system use

### 3.7 System Management Bus (I<sup>2</sup>C)

The System Management Bus (SMB) controller is integrated into the VT82C686B chip on the ETX-EV133. There are several slave devices that reside on the SMB. Their addresses are as follows:

Address	Function	Device
1010000	Identification Info	SODIMMO
1011110	CMOS setting backup	EEPROM
Inside LAN ID	Control and Status	Ethernet # 1



## 4 Phoenix Award BIOS

### 4.1 Description

The ETX-EV133 module has a Phoenix Award PCI/ISA BIOS ver. 6.0 for system configuration. The Award BIOS setup program is designed to provide maximum flexibility in configuring the system by offering various options that can be tailored for end-user requirements. This chapter is written to assist you in the proper usage of these features.

### 4.2 Main Menu

To access the Phoenix AWARD PCI/ISA BIOS Setup program, press <Del> key immediately after powering up the system. The Main Menu will be displayed.

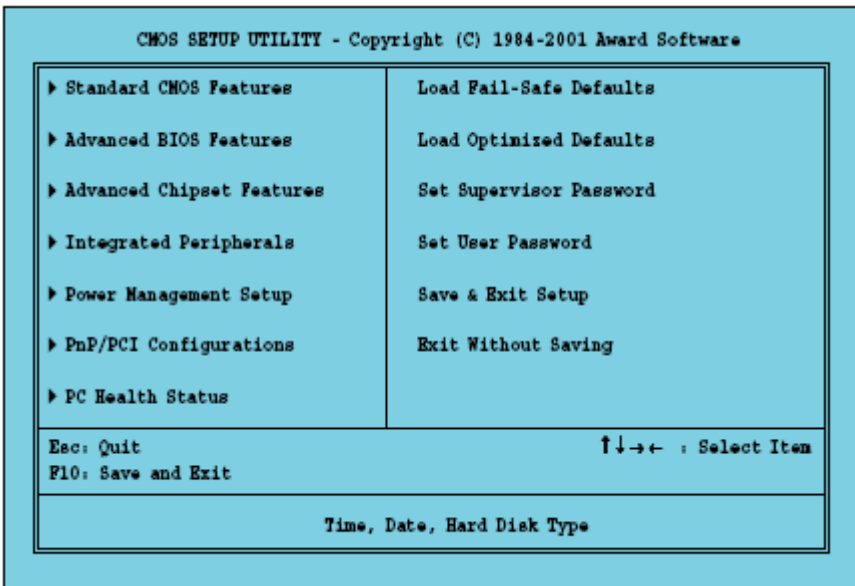


Figure 4-1: AWARD BIOS Main Menu

- ▶ **Standard CMOS Features:** Use this menu for basic system configuration (see Section 4.3).
- ▶ **Advanced BIOS Features:** Use this menu to set the Advanced Features available on your system (see Section 4.4).
- ▶ **Advanced Chipset Features:** Change values in the chipset registers and optimize your system's performance (see Section 4.5).
- ▶ **Integrated Peripherals:** Use this menu to specify your settings for integrated peripherals (see Section 4.6).
- ▶ **Power Management Setup:** Use this menu to specify your settings for power management (see Section 4.7).
- ▶ **PnP/PCI Configuration:** This entry appears if your system supports PnP/PCI (see Section 4.8).
- ▶ **PC Health Status:** Use this menu to specify your settings for frequency/voltage control (see Section 4.9).
- ▶ **Load Fail-Safe Defaults:** Loads the BIOS default values for the minimal/stable performance for your system to operate.
- ▶ **Load Optimized Defaults:** Loads the BIOS default values that are factory settings for optimal system performance.
- ▶ **Supervisor / User Password:** Use this menu to set User and Supervisor Passwords.
- ▶ **Save & Exit Setup:** Save CMOS value changes to CMOS and exit setup.
- ▶ **Exit Without Saving:** Abandon all CMOS value changes and exit setup.

### 4.3 Standard CMOS Features

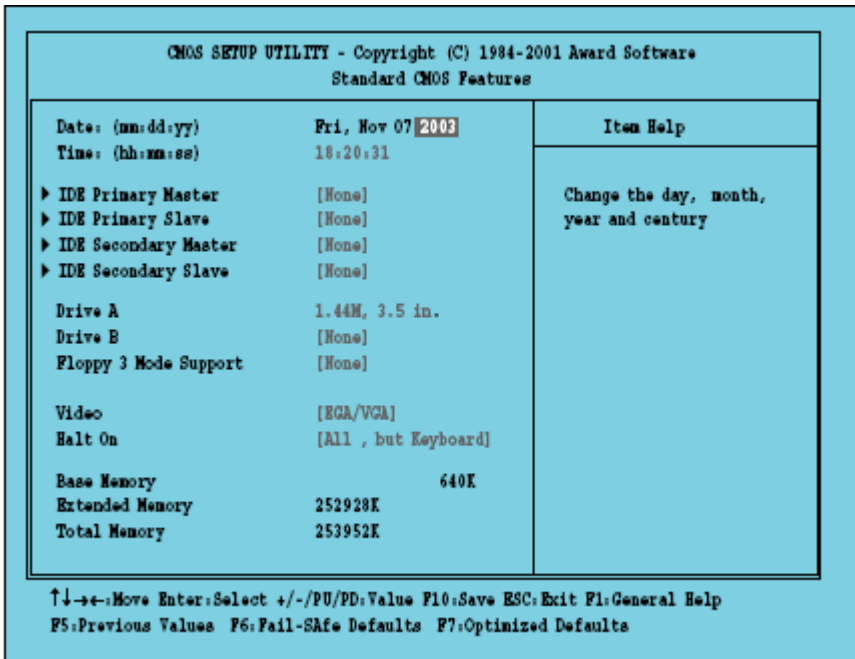


Figure 4-2: Standard CMOS Features Menu

The main menu includes the following main setup categories.

- ▶ **Date:** The BIOS determines the day of the week from 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 ( 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 and Secondary Master/Slave Items:** This selection brings you a configuration menu of the designated Drive.

- ▶ **Drive A, B:** Select the correct specifications for the diskette drive(s) installed in the computer.
  - ▷ None: No diskette drive installed.
  - ▷ 360K: 5-1/4 inch PC-type standard drive.
  - ▷ 1.2M: 5-1/4 inch AT-type high-density drive.
  - ▷ 720K: 3-1/2 inch double-sided drive.
  - ▷ 1.44M: 3-1/2 inch double-sided drive.
  - ▷ 2.88M: 3-1/2 inch double-sided drive.
- ▶ **Floppy Mode 3 Support:** Enables support for 1.2 MB format capacity on 3-1/2 inch disk drives. This format is commonly used in Japan. Options are: disabled, drive A, drive B, both.
- ▶ **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 any non-fatal error, POST stops and prompts 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 keyboard / disk error, but stops for all other errors.



## IDE Primary and Secondary Master/Slave Items

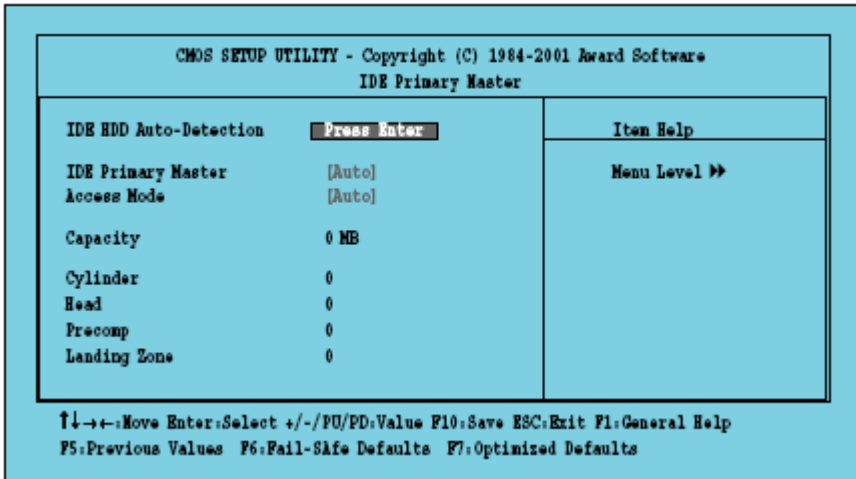


Figure 4-3: IDE Primary and Secondary Master/Slave Items Menu

### IDE HDD Auto-detection Press Enter

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 NoneAutoManual

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: PRE-COMP=65535 means NONE!

### Capacity Auto Display disk size

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/Auto

Choose the access mode for this hard disk.

## 4.4 Advanced BIOS Features

This section allows you to configure your system for basic operation. You have the opportunity to select the system's default speed, boot-up sequence, keyboard operation, shadowing, security.

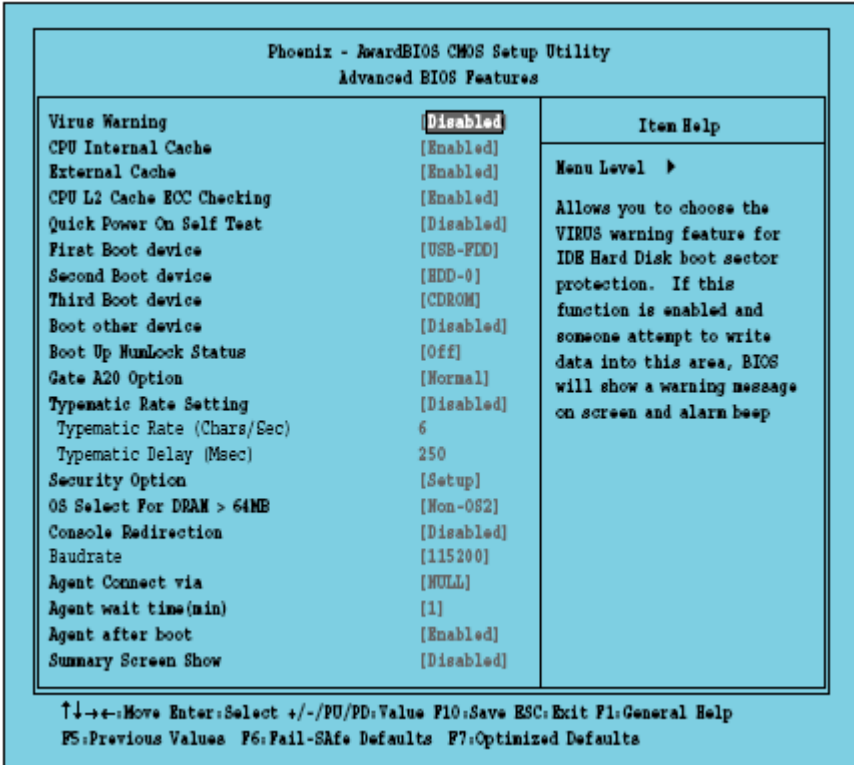


Figure 4-4: Advanced BIOS Features Menu

### Virus Warning

Allows you to choose the VIRUS Warning feature for IDE Hard Disk boot sector protection. If this function is enabled and an attempt is made to write data into this area, BIOS will show a warning message on screen and alarm beep. Enabled: Activates automatically when the system boots up causing a warning mes-

sage to appear when anything attempts to access the boot sector or hard disk partition table. Disabled: No warning message will appear.

### **CPU Internal Cache / CPU 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. 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 Boot Device**

Enter brings you to Boot Device Menu. The BIOS attempts to load the operating system from the selected device. See menu for possible options.

### **Boot Other Device**

When enabled the BIOS will try to boot from second or third option if booting from first device fails. When disabled the BIOS will not use the alternative devices.

### **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. Choices: Enabled/Disabled.

**Typematic Rate (Chars/Sec)**

Sets the number of times a second to repeat a key stroke when you hold the key down. Choices: 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. Choices: 250, 500, 750, 1000.

**Security Option**

Select whether the password is required every time the system boots or only when you enter setup. Choices: 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. 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. Choices: Non-OS2, OS2.

**Console Redirection**

Award's Preboot Agent provides you with console redirection to let you control a remote PC or embedded system via modem or direct serial connection at boot time. Choices: Enable, Disable.

**Baudrate**

Select baud rate: 9600, 19200, 38400, 57600 and 115200.

**Agent Connect via**

Fixed to NULL (Null modem cable), no selection possible.

**Agent wait time (min)**

Timeout in minutes to install agent if no serial connection can be established.

**Agent after boot**

Enable this option to keep the Agent running after OS boot.

**Summary Screen Show**

Suppress the summary screen. Choices: Enable, Disable.

## 4.5 Advanced Chipset Features

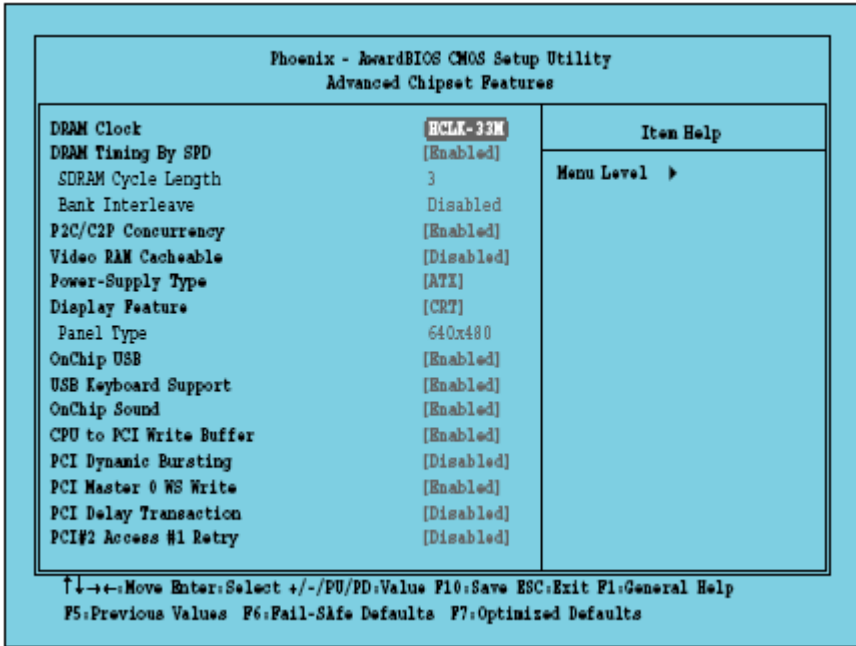


Figure 4-5: Advanced Chipset Features Menu

### 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.

### DRAM Timing by SPD

If your DIMM memory has SPD (Serial Presence Detect) 8-pin IC on module, you can set this option to Enabled. System will set your DRAM clock and timing from the SPD IC. If the option is set as Disabled, DRAM clock and timing must be set from the items below. (SDRAM Cycle Length and Bank Interleave).

### 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.

### **P2C/C2P Concurrency**

This item allows you to enable/disable the PCI to CPU, CPU to PCI concurrency. Choices: Enabled, Disabled.

### **Video RAM Cacheable**

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

### **OnChip USB**

This should be enabled if your system has a USB installed on the system board and you want to use it. Even when so equipped, if you add a higher performance controller, you will need to disable this feature. Choices: Enabled, Disabled.

### **USB Keyboard Support**

Select Enabled if your system contains a Universal Serial Bus (USB) controller and you have a USB keyboard. Choices: Enabled, Disabled.

### **OnChip Sound**

This item allows you to control the onboard AC 97 audio. Choices: Auto, Disabled.

### **CPU to PCI Write Buffer**

When this field is Enabled, writes from the CPU to the PCI bus are buffered, to compensate for the speed differences between the CPU and the PCI bus. When Disabled, the writes are not buffered

and the CPU must wait until the write is complete before starting another write cycle. Choices: Enabled, Disabled.

### **PCI Dynamic Bursting**

This item allows you to enable/disable the PCI dynamic bursting function. Choices: Enabled, Disabled.

### **PCI Master 0 WS Write**

When Enabled, writes to the PCI bus are executed with zero wait states.

### **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. Choices: Enabled, Disabled.

### **PCI#2 Access #1 Retry**

When disabled, PCI#2 will not be disconnected until access finishes (default). When enabled, PCI#2 will be disconnected if max retries are attempted without success. Choices: Enabled, Disabled.

## 4.6 Integrated Peripherals

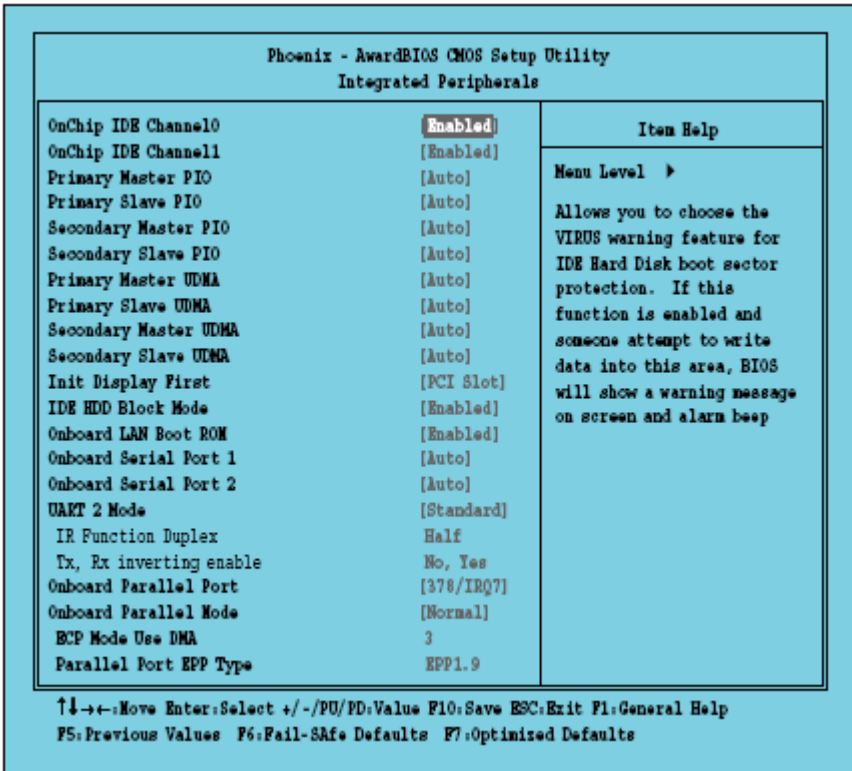


Figure 4-6: Integrated Peripherals Menu

### OnChip IDE Channel 0/1

The chipset contains a PCI IDE interface with support for two IDE channels. Select Enabled to activate the primary IDE interface. Select Disabled to deactivate this interface.

### Primary & Secondary Master/Slave PIO

The four IDE PIO (Programmed Input/Output) fields let you set a PIO mode (0-4) for each of the 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. Choice: Auto, Mode 0, Mode 1, Mode 2, Mode 3, Mode 4.



### **Primary & Secondary Master/Slave UDMA**

Ultra DMA implementation is possible only if your IDE hard drive supports it and the operating environment includes a DMA driver. If your hard drive and your system software both support Ultra DMA, select Auto to enable BIOS support.

### **Init Display First**

This item allows you to decide to active either PCI Slot or AGP first.

### **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 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 2 Mode**

This item allows you to select which mode for the Onboard Serial Port 2. Choices: Standard, HPSIR, ASKIR.

#### **IR Function Duplex**

This item allows you to select the IR half/full duplex function. Choices: Half, Full.

#### **TX,RX inverting enable**

This item allow you to enable the TX, RX inverting which depends on different H/W requirement. This field is not recommended to change its default setting for avoiding any error in your system Choices: No, No/No, Yes(Default)/Yes, No/Yes, Yes.

### **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.

## 4.7 Power Management Setup

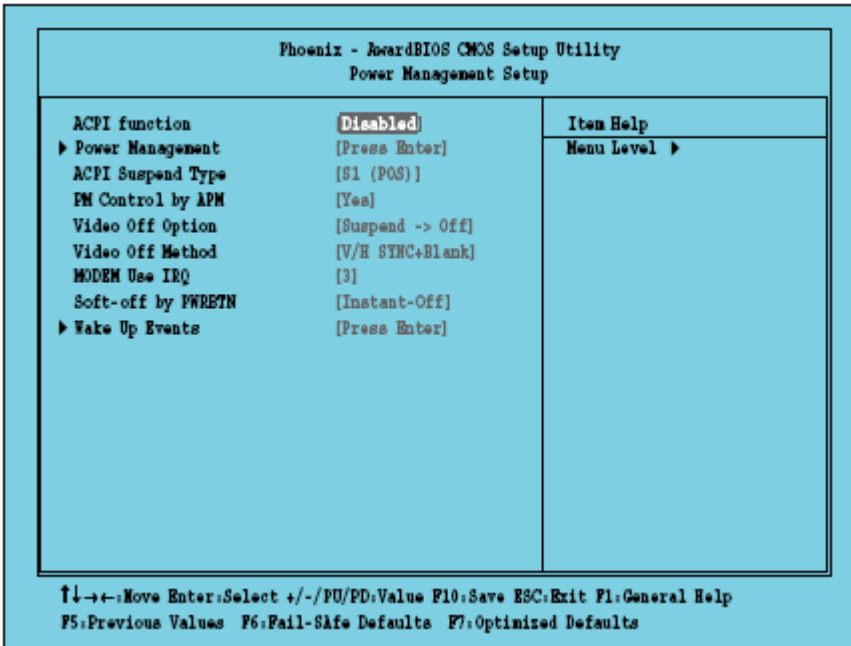


Figure 4-7: Integrated Peripherals Menu

### ACPI Function

Select Enabled only if your computer's operating system supports ACPI (the Advanced Configuration and Power Interface) specification. Currently, Windows 98 and Windows 2000 support ACPI.

### Power Management

There are 4 selections for Power Management (other than *Disabled*), 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

### **ACPI Suspend Type:**

**S1 (POS) Power On suspend:** All devices are powered up except for the clock synthesizer. The Host and PCI clocks are inactive and PIIX4 provides control signals and 32-kHz Suspend Clock (SUSCLK) to allow for DRAM refresh and to turn off the clock synthesizer. The only power consumed in the system is due to DRAM Refresh and leakage current of the powered devices. When the system resumes from POS, PIIX4 can optionally resume without resetting the system, can reset the processor only, or can reset the entire system. When no reset is performed, PIIX4 only needs to wait for the clock synthesizer and processor PLLs to lock before the system is resumed. This takes typically 20 ms.

**S3 (STR) Suspend To RAM:** Power is removed from most of the system components during STR, except the DRAM. Power is supplied to Suspend Refresh logic in the Host Controller, and RTC and Suspend Well logic in PIIX4. PIIX4 provides control signals and 32-kHz Suspend Clock (SUSCLK) to allow for DRAM refresh and to turn off the clock synthesizer and other power planes.

### **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 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 causes 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.
- ▷ DPMSInitial: 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

On: After a power failure, the system will automatically reboot as soon as power is restored.

Off: After a power failure, the system will not reboot when power is restored. The system needs to be turned on again manually.

Auto: After a power failure, the system will automatically reboot as soon power is restored if the PC was turned on when the power failed. If the PC was already turned off when the power failed, the system needs to be turned on again manually.

## Wake Up Events

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

- ▷ VGA
- ▷ LPT & COM
- ▷ HDD & FDD
- ▷ PCI Master
- ▷ Power On by PCI Card
- ▷ Wake Up on LAN/Ring
- ▷ RTC Alarm Resume
- ▷ Date (of Month)
- ▷ Resume Time (hh:mm:ss)
- ▷ Primary INTR
- ▷ IRQs Activity Monitoring

## 4.8 PnP/PCI Configuration



**Figure 4-8: PnP/PCI Configuration Menu**

This section describes configuration of 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.

### 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 Plug and Play BIOS can automatically configure all 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.

## **4.9 PC Health Status**

### **CPU Warning Temperature**

Brings up a submenu that lets you assign a temperature level that is not to be exceeded by the CPU. If the CPU temperature goes over this limit a audio warning signal sounds

### **Current CPU Temp.**

Displays the current CPU temperature.

### **Current System Temp.**

Displays the current system temperature.

### Vcore, 2.5V, 3.3V, 5V

Displays the actual voltage levels on the board.

### Case Open Warning

When enabled an audible signal is generated when pin GPE1# and CBLID\_P# on X4 are disconnected.

## 4.10 BIOS POST Codes

POST (hex)	Description
CFh	Test CMOS R/W functionality.
C0h	Early chipset initialization: <ul style="list-style-type: none"> <li>- Disable shadow RAM</li> <li>- Disable L2 cache (socket 7 or below)</li> <li>- Program basic chipset registers</li> </ul>
C1h	Detect memory <ul style="list-style-type: none"> <li>- Auto-detection of DRAM size, type and ECC</li> <li>- Auto-detection of L2 cache (socket 7 or below)</li> </ul>
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.



POST (hex)	Description
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 Early_Init_Onboard_Generator switch.
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

POST (hex)	Description
23h	<ol style="list-style-type: none"> <li>1. Check validity of RTC value:e.g. a value of 5Ah is an invalid value for RTC minute.</li> <li>2. Load CMOS settings into BIOS stack. If CMOS checksum fails, use default value instead.</li> <li>3. Prepare BIOS resource map for PCI &amp; PnP use. If ESCD is valid, take into consideration of the ESCD's legacy information.</li> <li>4. Onboard clock generator initialization. Disable respective clock resource to empty PCI &amp; DIMM slots.</li> <li>5. Early PCI initialization:               <ul style="list-style-type: none"> <li>- Enumerate PCI bus number</li> <li>- Assign memory &amp; I/O resource</li> <li>- Search for a valid VGA device &amp; VGA BIOS, and put it into C000:0.</li> </ul> </li> </ol>
24h	Reserved
25h	Reserved
26h	Reserved
27h	Initialize INT 09 buffer
28h	Reserved
29h	<ol style="list-style-type: none"> <li>1. Program CPU internal MTRR (P6 &amp; PII) for 0-640K memory address.</li> <li>2. Initialize the APIC for Pentium class CPU.</li> <li>3. Program early chipset according to CMOS setup.</li> <li>4. Measure CPU speed.</li> <li>5. Invoke video BIOS.</li> </ol>
2Ah	Reserved
2Bh	Reserved
2Ch	Reserved
2Dh	<ol style="list-style-type: none"> <li>1. Initialize multi-language</li> <li>2. Put information on screen display, including Award title, CPU type, CPU speed ....</li> </ol>
2Eh	Reserved
2Fh	Reserved
30h	Reserved
31h	Reserved
32h	Reserved
33h	Reset keyboard except Winbond 977 series Super I/O chips.
34h	Reserved

POST (hex)	Description
35h	Test DMA Channel 0
36h	Reserved
37h	Test DMA Channel 1
39h	Test DMA Page Registers
3Ah	Reserved
38h	Reserved
3Bh	Reserved
3Ch	Test 8254 Channel 2
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 writes 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 CPU2.</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>

POST (hex)	Description
4Fh	Reserved
50h	Initialize USB
51h	Reserved
52h	Test all memory (clear all extended memory to 0)
53h	Reserved
54h	Reserved
55h	Display number of processors (multi-processor platform)
56h	Reserved
57h	1. Display PnP logo 2. Early ISA PnP initialization 3. Assign CSN to every ISA PnP device.
58h	Reserved
59h	Initialize the combined Trend Anti-Virus code.
5Ah	Reserved
5Bh	Test EISA available memory
5Ch	Reserved
5Dh	1. Initialize Init_Onboard_Super_IO switch. 2. Initialize Init_Onboard_AUDIO switch.
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	Reserved
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

POST (hex)	Description
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	Initialize fixed disk controller
74h	Reserved
75h	Detect & install all IDE devices: HDD, LS120, ZIP, CDROM.....
76h	Reserved
77h	Detect serial ports & parallel ports.
78h	Reserved
79h	Reserved
7Ah	Detect & install co-processor
7Bh	Reserved
7Ch	Reserved
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: Clear EPA or customization logo.
80h	Reserved
81h	Reserved
82h	1. Call chipset power management hook. 2. Recover the text font 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

POST (hex)	Description
84h	Initialize ISA PnP boot devices
85h	<ol style="list-style-type: none"> <li>1. USB final Initialization</li> <li>2. NET PC: Build SYSID structure</li> <li>3. Switch screen back to text mode</li> <li>4. Set up ACPI table at top of memory.</li> <li>5. Invoke ISA adapter ROMs</li> <li>6. Assign IRQs to PCI devices</li> <li>7. Initialize APM</li> <li>8. Clear noise of IRQs.</li> </ol>
86h	Reserved
87h	Reserved
88h	Reserved
89h	Reserved
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 boot up speed</li> <li>3. Chipset final initialization.</li> <li>4. Power management final initialization</li> <li>5. Clear screen &amp; display summary table</li> <li>6. Program K6 write allocation</li> <li>7. Program P6 class write combining</li> </ol>
95h	<ol style="list-style-type: none"> <li>1. Program daylight saving</li> <li>2. Update keyboard LED &amp; typematic rate</li> </ol>
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)

## 5 Driver Installation

This chapter describes the installation procedure for all device drivers for the NuPRO-795 running Windows 2000/XP.

### 5.1 VIA Hyperion 4in1 Drivers

The VIA Hyperion 4in1 drivers includes four system drivers to improve performance and maintain stability of systems using VIA chipsets. These four drivers are:

- ▶ VIA Registry (INF) Driver
- ▶ VIA AGP VxD driver
- ▶ VIA ATAPI Vendor Support Driver
- ▶ VIA PCI IRQ Miniport Driver

The VIA Hyperion 4in1 drivers automatically detect your operating system and will install only the necessary drivers. The driver features are as follows:

- ▶ VIA IDE Bus Master Driver: For Windows NT users, the VIA IDE Bus Mastering driver is the only driver that will be installed on your system.
- ▶ VIA Registry (INF) Driver will be installed. The driver will enable the VIA Power Management function.
- ▶ VIA AGP Vxd Driver will provide service routines for your VGA driver and interface directly to hardware, providing fast graphical access.
- ▶ The IDE Filter driver enables the performance enhancing bus mastering functions of ATA-capable hard disk drives and ensures IDE device compatibility (also known as the ATAPI Vendor Support Driver).

#### Installation Procedure

1. Operating System Requirements: Windows 2000/XP must be fully installed and running on the system prior to installing drivers.
2. Close any running applications.

3. On the ADLINK All-in-One CD, navigate to **X:\NuPRO\NuPRO-795\Chipset** (where X: is the location of the CD-ROM drive), and run **VIAHyperion4in1453v.EXE**.
4. Bypass the *Welcome* dialog by clicking **Next**.
5. The *readme* file will appear, which contains similar information to this installation guide. Click **Yes** to continue.
6. Keep the default setup and click *Enable Normal Installation* in *Setup Mode Option*. Click **Next** to continue.
7. Keep the default setup that selects all three items *VIA PCI IDE Bus Driver*, *AGP Driver (AGP 3.0 Supported)*, and *VIA INF Driver 2.00a* in *Setup Mode Option*. Click **Next** to continue.
8. Keep the default setup that selects *Install VIA PCI IDE Bus Driver on VIA PCI IDE Bus Driver 1.2a*, then click **Next** to continue.
9. Keep the default setup that selects *Install AGP driver on VIA GART AGP Driver 4.42b*, then click **Next** to continue.
10. The Hyperion 4in1 drivers will automatically detect which drivers you need and will tick the boxes corresponding to the necessary drivers. It is recommended that you leave these boxes as they appear, unless you are an advanced user. Click **Next**.
11. You will be presented with a window that reads:

Set up has finished copying files to your computer. Before you can use the program you must restart Windows or your computer. *Yes I want to restart my computer now* (ticked by default).

Remove any disks from your drives and then click **Finish** to complete the installation.
12. Your computer will restart itself and the installation process is complete.



## 5.2 VGA Driver

This section provides information on how to install the VGA driver that comes on the ADLINK All-in-One CD. Please follow the instructions set forth in this section carefully. Note that the appropriate operating system must be installed on your system before you can install the VGA driver.

The following section describes the display driver installation procedure for Windows 2000/XP.

### Installation Procedure

1. Boot Windows 2000/XP.
2. The driver is included on the ADLINK All-in-One CD. Run **SETUP.exe** in the following directory: **X:\NuPRO\NuPRO-795\VGA\Setup** (where X: is the location of the CD-ROM drive).
3. Click **Next** on the *Welcome screen* to read and agree to the license agreement.
4. Click **Yes** if you agree to continue. (NOTE: If you click **No**, the program will terminate.)
5. Click **Yes** to restart your computer to allow the new settings to take effect.
6. Follow the screen instructions and use default settings to complete setup when Windows 2000/XP restarts.

## 5.3 Realtek RTL8139CL+ Ethernet Controller

This chapter describes the LAN driver installation for the RTL8139CL+ onboard Ethernet controller. The relevant drivers are in the following directory on the ADLINK All-in-One CD: **X:\NuPRO\NuPRO-795\LAN** (where X: is the location of the CD-ROM drive).

In the following section, we will describe the LAN driver installation for Windows 2000/XP.

## Installation Procedure

Although Windows 2000/XP may automatically install a LAN driver, to ensure compatibility we recommend that you manually install the most up-to-date driver which is included on the ADLINK All-in-One CD. After installing Windows 2000, please update to the new driver using the following procedure.

1. Boot Windows 2000/XP, click **Start**, select **Settings**, and then double-click **Control Panel**.
2. Double-click the **System** icon, click the **Hardware** tab, and click the **Device Manager** button.
3. Double-click **Network Adapters**, then double-click the **Realtek RTL 8139C+ PCI Fast Ethernet Adapter** entry.
4. Click the **Driver** tab, then click the **Update Driver** button.
5. An *Upgrade Device Driver Wizard* will appear. Click **Next**.
6. Select **Display a list of ...** and click **Next**. The next window may show a list of hardware models.
7. Insert the ADLINK All-in-One CD and click **Have Disk**.
8. Browse to the RTL-8139C+ driver in the following path: **X:\NuPRO\NuPRO-795\LANWin2000**. Select **Netrts5.inf**, click **Open**, then click **OK**.
9. Select **Realtek RTL8139CL+ PCI Fast Ethernet Adapter**, then click **Next**. An *Update Driver Warning* window may pop up, click **Yes** to continue.
10. Click **Next** when the *Wizard Summary* window appears.
11. Click the **Finish** button, then click the **Close** button.

### 5.4 Audio Driver

This section describes the Audio driver installation for the Avance AC'97 onboard Audio controllers. The relevant driver is located in the following directory on the ADLINK All-in-One CD: **X:\NuPRO\NuPRO-795\Audio**.

The following section describes the display driver installation procedure for Windows 2000/XP.

## Installation Procedure

1. Boot Windows 2000/XP.
2. Locate the directory **X:\NuPRO\NuPRO-795\Audio** on the CD-ROM, and run **wdm\_a362.exe**.
3. Click **Next** on the *Welcome* screen, and then click **Next** to continue driver installation.
4. Finally, click **Finish** to re-start.



## 6 Watchdog Timer

The NuPRO-795 includes a watchdog timer (WDT) that consists of a one-second resolution down counter. Once a value is written to the WDT, the timer automatically starts to count down. If the counter ever reaches zero before the software restarts it, the software is presumed to be malfunctioning and the processor's RESET signal is asserted.

The watchdog function can be enabled or disabled by setting the control register at I/O port 440h and 443h.

Status	Action
Enable / Refresh the Watchdog Timer	Write timeout value to address 440h
Disable the Watchdog Timer.	Read 443h

### Programming Examples:

#### Enable Watchdog Timer:

Write Timeout value to I/O port 440h

```
mov dx, 440
mov al, <0~255>
out dx, al
```

#### Disable Watchdog Timer:

Write and Value to I/O port 443h

```
mov dx, 443h
mov al, 1<0-255>
out dx, al
```

Value	Timeout
0	None
1	1 sec
2	2 sec
3	3 sec
4	4 sec
5	5 sec
6	6 sec
7	7 sec
8	8 sec
9	9 sec
A	10 sec
B	11 sec
C	12 sec
D	13 sec
E	14 sec
F	15 sec
...	...
FF	255 sec



## Warranty Policy

Thank you for choosing ADLINK. To understand your rights and enjoy all the after-sales services we offer, please read the following carefully.

1. Before using ADLINK's products please read the user manual and follow the instructions exactly. When sending in damaged products for repair, please attach an RMA application form which can be downloaded from: <http://rma.adlinktech.com/policy/>.
2. All ADLINK products come with a two-year guarantee:
  - ▶The warranty period starts from the product's shipment date from ADLINK's factory.
  - ▶Peripherals and third-party products not manufactured by ADLINK will be covered by the original manufacturers' warranty.
  - ▶For products containing storage devices (hard drives, flash cards, etc.), please back up your data before sending them for repair. ADLINK is not responsible for loss of data.
  - ▶Please ensure the use of properly licensed software with our systems. ADLINK does not condone the use of pirated software and will not service systems using such software. ADLINK will not be held legally responsible for products shipped with unlicensed software installed by the user.
  - ▶For general repairs, please do not include peripheral accessories. If peripherals need to be included, be certain to specify which items you sent on the RMA Request & Confirmation Form. ADLINK is not responsible for items not listed on the RMA Request & Confirmation Form.

3. Our repair service is not covered by ADLINK's two-year guarantee in the following situations:
  - ▶ Damage caused by not following instructions in the user's manual.
  - ▶ Damage caused by carelessness on the user's part during product transportation.
  - ▶ Damage caused by fire, earthquakes, floods, lightening, pollution, other acts of God, and/or incorrect usage of voltage transformers.
  - ▶ Damage caused by unsuitable storage environments (i.e. high temperatures, high humidity, or volatile chemicals).
  - ▶ Damage caused by leakage of battery fluid during or after change of batteries by customer/user.
  - ▶ Damage from improper repair by unauthorized technicians.
  - ▶ Products with altered and/or damaged serial numbers are not entitled to our service.
  - ▶ Other categories not protected under our warranty.
4. Customers are responsible for shipping costs to transport damaged products to our company or sales office.
5. To ensure the speed and quality of product repair, please download an RMA application form from our company website: <http://rma.adlinktech.com/policy>. Damaged products with attached RMA forms receive priority.

If you have any further questions, please email our FAE staff: [service@adlinktech.com](mailto:service@adlinktech.com).