User's Manual

GLOBAL
American, Inc.
Integration with Integrity

Industrial PC-based Automation

3307483

Full Size PICMG Dual Socket 370 Pentium III / Celeron PC-133 CPU Card with 64 bit PCI bus, Dual Fast Ethernet, and DiskOnChipSocket

Manual edition 1.0, June 2002

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Part number : 4011632100100

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Introduction

The SBC is based on ServerWorks ServerSet III LE chipset that combines PC-133, 100/133MHz FSB, with IDE RAID up to UltraDMA/133 IDE technologies and ATI RAGE XL with 8 MB SDRAM for 2D/3D graphics capabilities in a single package. Its onboard 10Base-T/100Base-TX Fast Ethernet, CRT display controller, and Flat TMDS Panel Link LCD with DVI Interfaces add communication and multimedia features to its powerfull function.

The range of dual CPUs including Intel® Pentium® III/ Tualatin ™processors are supported up to 1.4GHz at 133MHz FSB by significantly increasing the bandwidth available for multiproceesor servers, while memory is expandable to 4GB PC-133 Registered SDRAM.

The SeverSet III LE chipset consists of the NB6635 Northbridge 3.0LE and IB6566 Southbridge. Advanced 64-bit PCI Technology supports up to 2 full 64-bit/66 Mhz PCI busses and 5 64-bit/33 Mhz PCI busses. Also supports the industry standard Server Management Bus. Other exclusive features include onboard DiskOnChip®+ 2000 socket for memory up to 288MB.

Specifications

General Specifications

- CPU : Dual Socket 370 FC-PGA/FC-PGA2 Pentium®III, Tualatin with 133/100 MHz FSB
- Chipset : ServerSet III LE (NB6635 Northbridge 3.0LE and IB6566 South-bridge) supports PC-133 memory bus, 133MHz FSB, 64-bit PCI bus at 66/33 Mhz and UltraATA/33 IDE interfaces
- BIOS : AWARD® Flash BIOS Green&Soft Off function version 6.0, LS120, multiple boot function
- Green Function : power saving supported in BIOS. DOZE / SUSPEND modes, ACPI & APM
- L2 Cache : Integrated on CPU
- DRAM Memory : Supports PC-133 Registered SDRAM up to 4GB in four 168-pin DIMM sockets
- Enhanced IDE RAID with UltraDMA : Supports one port with two ATAPI devices up to UltraDMA transfer 133 MB/sec by using HighPoint HPT-371 IDE controller . Another onboard IDE port only can support to 33 MB/sec
- 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 for 5 years of data retention. CMOS data backup of BIOS setup and BIOS default.
- USB : Onboard 2 x USB ver 1.1 ports (2 x 5-pin header)

High Speed Multi I/O

- Chipset : SMSC FDC 37B787
- Serial Ports : one external high speed RS-232C port COM1 (DB9 on bracket), one internal high speed RS-232C port COM2 (jumper selectable, 10-pin box header). Both with 16C550 compatible UART and 16 byte FIFO.
- SIR Interface : onboard IrDA TX/RX port (5-pin header)
- Floppy Disk Drive Interface : 2 floppy disk drives, 5¼" (360 KB or 1.2 MB) and 3½" (720 KB, 1.44 MB or 2.88 MB).
- Bi-directional Parallel Port : SPP, EPP and ECP mode.
- Keyboard and Mouse Connectors : external PS/2 KB/Mouse port (2-in-1 mini DIN) onboard AT Keyboard port (5-pin box header)

Network Interface Controller

- Chipset : 2 x Intel 82559, 10/100 Mbps, autoswitching
- Connector : external RJ-45 with LEDs on bracket

Display Controller

- Chipset : ATI RAGE XL with 2D/3D engines Supports 8MB on board SDRAM
- Display Type : CRT (VGA, SVGA, XGA, SXGA) and LCD (optional, see LCD Daughterboard) Type
- Connectors : external DB15 for CRT on bracket and DVI Connector for TMDS daughterboard
- LCD Display Daughterboard (optional) : TMDS Panel Link with DVI interface

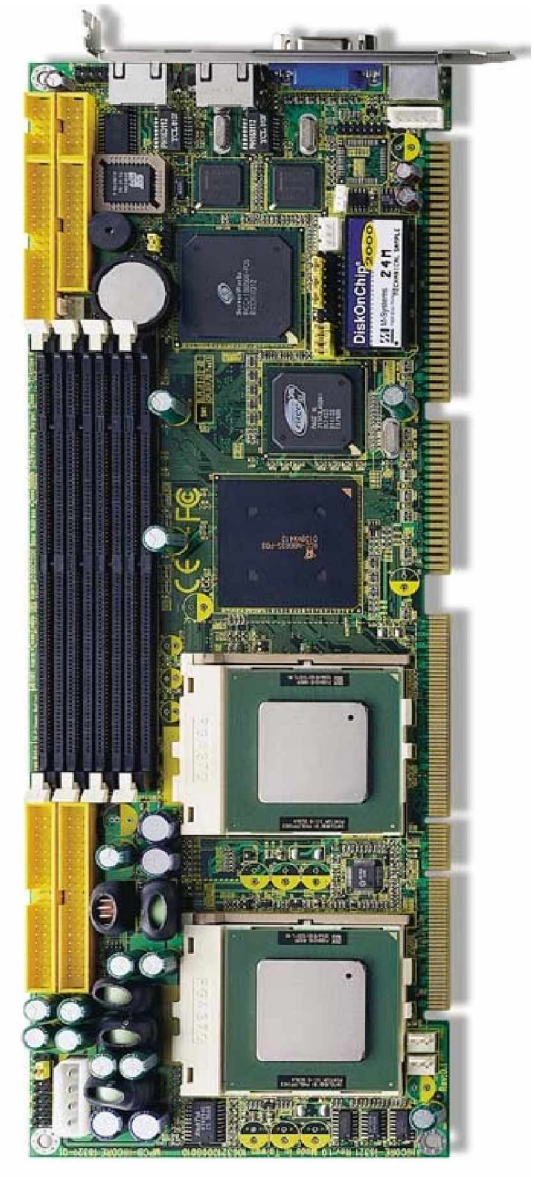
Flash Disk DiskOnChip®2000

- Package : Single Chip Flash Disk in 32-pin DIP JEDEC
- Capacity : up to 288 MByte
- Data Reliability : ECC/EDC error correction
- Memory Window : 8 KByte

Environmental and Power

- Power Requirements : +5 V @ 10.03 A (typical), +12 V @ 0.44A (typical), -12 V @ 0.08A (typical); (FC-PGA2 Tualatin 1.26 GHz x2 at 133 FSB and 2048 MB PC-133 Registered SDRAM)
- CPU Power : onboard PWM switching power supply for autodetects CPU core voltage
- System Monitoring and Alarm : CPU and System temperature, system voltage and cooling fan RPM.
- Board Dimensions : 338 mm x 122 mm
- Board Weight : 0.6 Kg.
- Operating Temperature : 0 to 55°C (32 to 131°F)

Board Image



Warning

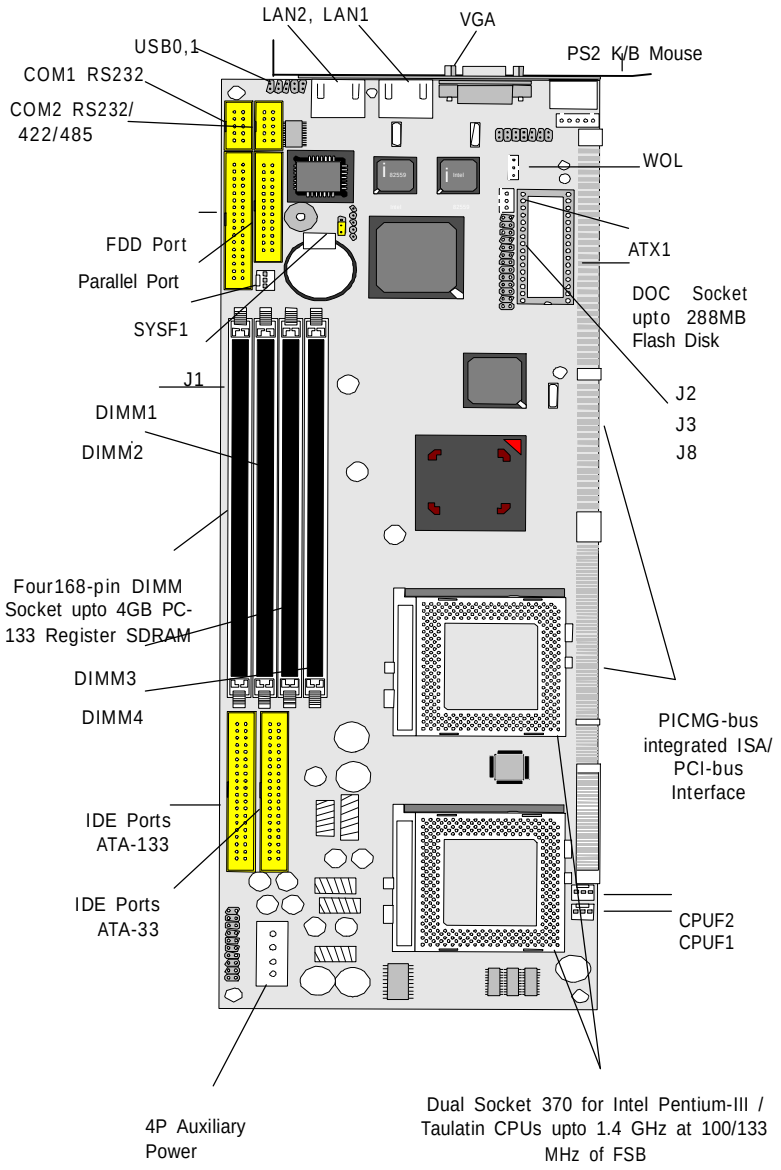
Single Board Computers and their components contain very delicate Integrated Circuits (IC). To protect the Single Board Computer and its components against damage from static electricity, you should always follow the following precautions when handling it :

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

3307483A	Full-size PICMG-bus Dual Socket 370 Pentium-III / Tualatin, PC-133 CPU Card with High Drive ISA, LCD/ CRT SVGA, Dual Ethernet
3307483B	Full-size PICMG-bus Dual Socket 370 Pentium-III / Tualatin, PC-133 CPU Card with High Drive ISA, LCD/CRT SVGA, Single Ethernet

Board Layout Front



Jumper/Connector Quick Reference

Jumpers

Label	Function
J1	Clear CMOS
J2	Watchdog Output
J3	DiskOnChip Base Address
J8	H/W Monitor Alarm

Jumper/Connector Quick Reference

Connectors

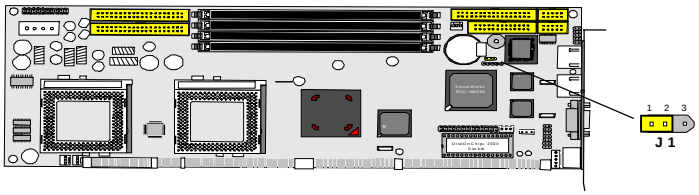
Lable	Function
ATX1	ATX Feature Connectorr
COM1	Serial Port: COM1
COM2	Serial Port: COM2
CPUF1	CPU FAN1 Connector
CPUF2	CPU FAN2 Connector
DIMM1	SDRAM bank 1/2 168 pin DIMM
DIMM2	SDRAM bank 3/4 168 pin DIMM
DIMM3	SDRAM bank 5/6 168 pin DIMM
DIMM4	SDRAM bank 7/8 168 pin DIMM
DFP	Flat Panel Connector
EKB	External Keyboard Connector
ESMI	External SMI
ESPK	External Speaker
FDD	Floppy Disk Driver Connector
HLED	HDD LED Connector
IDE1	Primary IDE Connector
IDE2	Secondary IDE Connector
KBM	PS/2 Keyboard & Mouse
LAN1	10/100M LAN1 Connector
LAN2	10/100M LAN2 Connector
LPT	Parallel Port
PLKL	Power LED & Keyboard Lock
PSON	ATX Soft Power Switch
PWR	4P Auxiliary Power Connector
SIR	Infrared (IR) Connector
SYSF	Chassis Auxiliary Fan Connector
RES	Reset Connector
USB1	USB Port 0,1
VGA	CRT SVGA Connector
WOL	Wake On LAN

CMOS Jumper Settings

CMOS Setup (J1)

Type : J1: onboard 3-pin header

CMOS Setup (J1)	J1	
Keep COMS	1-2	ON
Clear COMS	2-3	OFF
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 443h
Disable the Watchdog Timer.	I/O Read 044h

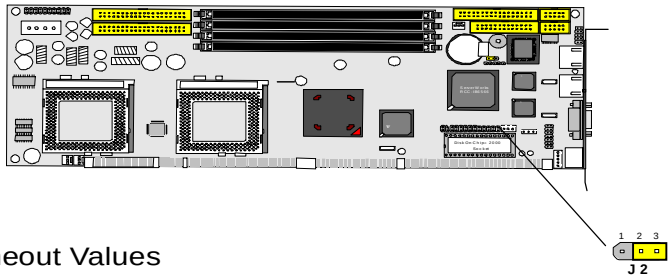
After the watchdog timer has been initialized by writing port F2, it has to be strobed at preconfigured intervals to keep it from issuing a RESET or NMI.

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:

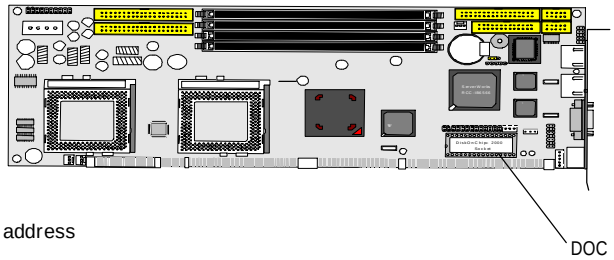
```
WDT_EN_RF       equ     443h

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
```

DiskOnChip® 2000 Flash Disk

DiskOnChip Base Address (J3)

Installation Instructions

1. Make sure the Single Board Computer is powered OFF.
2. Plug the DOC (DiskOnChip®2000) device into its socket. Verify the direction is correct (pin 1 of the DiskOnChip®2000 is aligned with pin 1 of the socket)



3. Set address

Base Address	Jumper Selected
D8000h	OFF
D0000h	ON

default setting

4. Power up the system
5. During power up you may observe a message displayed by the DOC when its drivers are automatically loaded into system's memory
6. At this stage the DOC can be accessed as any disk in the system
7. If the DOC is the only disk in the system, it will appear as the first disk (drive C: in DOS)
8. If there are more disks besides the DOC, the DOC will appear by default as the last drive, unless it was programmed as first drive. (please refer to the DOC utilities user manual)
9. If you want the DOC to be bootable:
   a - copy the operating system files into the DOC by using the standard DOS command (for example: sys d:)
   b - The DOC should be the only disk in the systems or should be configured as the first disk in the system (c:) using the DUPDATE utility

For more information on DiskOnChip®2000, visit M-Systems Web site at

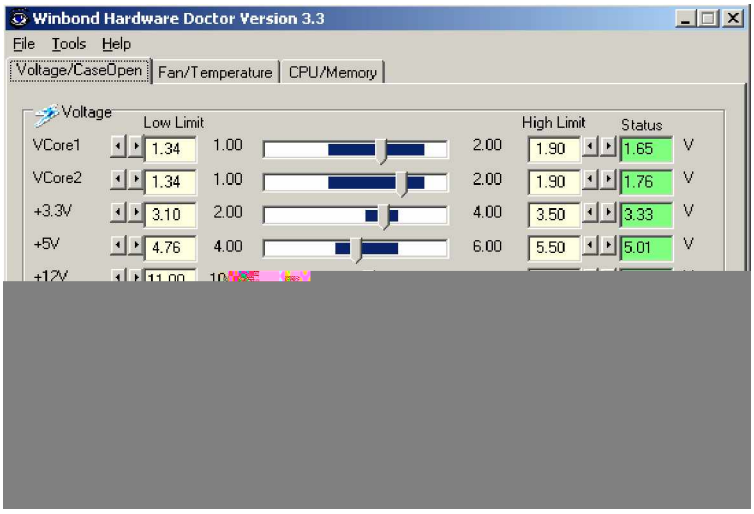
http:// www.m-sys.com

where you can find the utilities manual, data sheets and application notes. In addition, you can find the latest DiskOnChip®2000 S/W utilities.

Hardware monitor Alarm

Hardware monitor Alarm: J8

Hardware monitor alarm can be selected enable or disable by jumper (J8). There are three main functins for this item: Voltage/CaseOpen, Fan/Temperature and CPU/Memory.



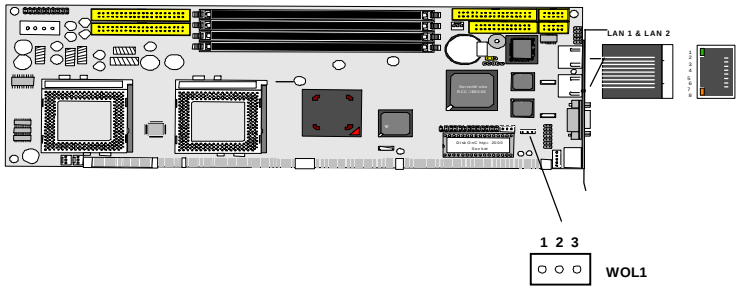
Dual Fast Ethernet Connectors

LAN Port

Connector : LAN1, LAN2
Type : external RJ-45 on bracket

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

LAN LED Indicator on RJ-45 connector



Connector : LED
Type : 2 LED

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

Wake On LAN

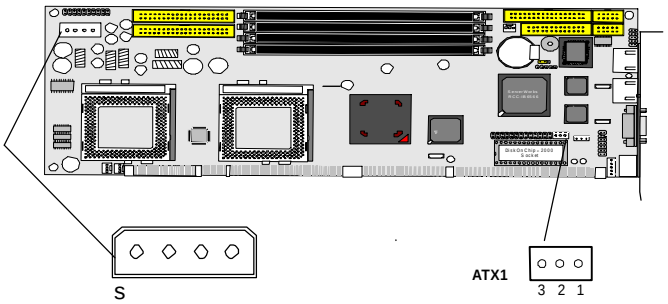
Connector: WOL1
Type : onboard 3-pin wafer connector

Pin	Description
1	5V_SB
2	GND
3	WOL_CTL

Power Connector

ATX Feature Connector

ATX Feature Connector:ATX1



Type : onboard 3-pin Wafer connector

Pin	Description
1	5V
2	GND
3	PS-ON

4P Auxilary Power

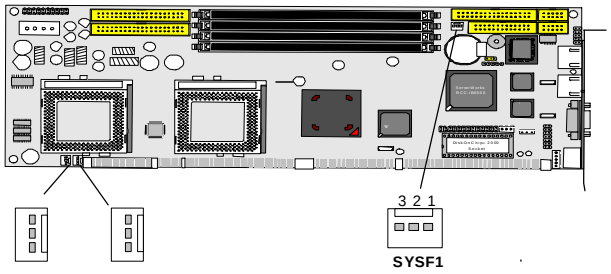
Connector : PWR
Type : onboard 4-pin Wafer connector

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

CPU Fan Connector

Connector : CPUF1 & CPUF2
Type : onboard 3-pin wafer connector

Pin	Description
1	GND
2	+12V
3	FAN_CTL

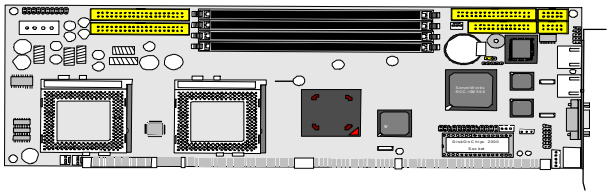


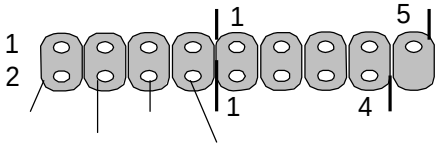
Chassis Auxilary Fan Connector

Connector : SYSF1
Type : onboard 3-pin header

Pin	Description
1	GND
2	+12V
3	FAN_CTL

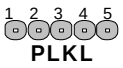
Switches and Indicators





Power LED and Keyboard Lock Connector

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

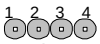


PLKL

Pin	Description
1	LED power (+5V)
2	NC
3	GND
4	Keyboard Lock
5	GND

External Speaker Connector

Connector : ESPK

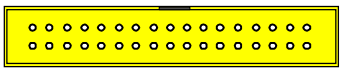


ESPK

Pin	Description
1	+5V
2	GND
3	Internal buzzer
4	Speak out

Interface Connectors HDD, FDD

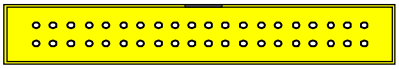
Floppy Disk Drive Connector



Connector : FDD
Type : onboard 34-pin box header

Pin	Description	Pin	Description
1	GND	2	DRIVE DENSITY SELECT 0
3	GND	4	DRIVE DENSITY SELECT 1
5	GND	6	NC
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 and IDE2
Type : Two onboard 40-pin box headers, primary and secondary IDE

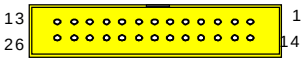
Pin	Description	Pin	Description
1	#RESET	2	GND
3	D7	4	D8
5	D6	6	D9
7	D5	8	D10
9	D4	10	D11
11	D3	12	D12
13	D2	14	D13
15	D1	16	D14
17	D0	18	D15
19	GND	20	NC/(Vcc)
21	REQ	22	GND
23	#IOW	24	GND
25	#IOR	26	GND
27	#IORDY	28	IDESEL
29	#DACK	30	GND
31	IRQ	32	NC
33	ADDR1	34	CBLID
35	ADDR0	36	ADDR2
37	#CS0	38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

There is an additional function for 3307483 on ATA-133 provided by High Point HPT-371 IDE controller. Please check append A for driver installation.

Peripheral Port

Parallel Port

Connector : LPT
Type : onboard 26-pin box header

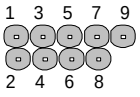


LPT1

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

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

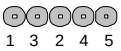


USB 1

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

SIR

Connector : SIR
Type : onboard 5-pin header

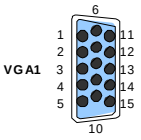


SIR

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

CRT SVGA

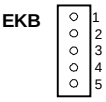
Connector : VGA1
Type : external 15-pin D-sub female connector on bracket



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

AT Keyboard

Connector : EKB
Type : Onboard 5-pin header



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

Note: ATKB1doesn't provide Vcc power pin on pin-5, that is, ATKB1 cannot connect to AT keyboard directly. ATBK1 supports AT keyboard with passive backplane.

PS/2 Keyboard & Mouse

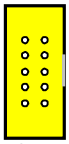
Connector: KMB
Type: external 6-pin Mini DIN connector on bracket

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

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

COM1 & COM2 for RS-232 Port

COM1
COM2



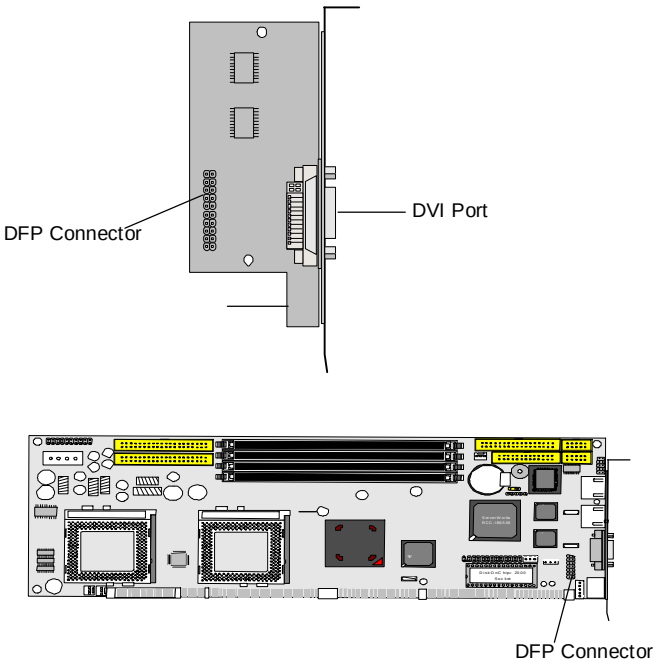
Connector : COM1 & COM2
Type : onboard 10-pin box header

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

Convertor Daughter Board

TMDS Panel Liknk Daughter Board

The daughter board contains a Flat Panel DVI port on bracket.



Flat Panel Connector

Connector : DFP
Type : On board 14-pin male connector with 20-pin male connector on bracket

Pin	Description	Pin	Description	Pin	Description
1	H_DEC	6	TX2P	11	TXCM
2	FP_Vcc	7	TX1M	12	TXCP
3	FP_SCLK	8	TX1P	13	GND
4	FP_SDAT	9	TX0M	14	GND
5	TX2M	10	TX0P		

System Resources

Interrupt Assignment

IRQ Address	Description
0	System Timer
1	Keyboard (or PS/2 Keyboard)
2	Programmable Interrupt Controller
3	Serial Port 2 (COM2)
4	Serial Port 1 (COM1)
5	USB & IRQ Holder for PCI Steering
6	Floppy controller
7	Parallel Port 1
8	Real-Time Clock
9	SCI IRQ used by ACPI bus
10	Ethernet & ACPI IRQ Holder for PCI IRQ Steering
11	Ethernet & HPT371 UDMA/ATA 133 Controller
12	PS/2 Mouse
13	Numeric data processor
14	Primary IDE Controller
15	Secondary IDE Controller

I/O Address Space

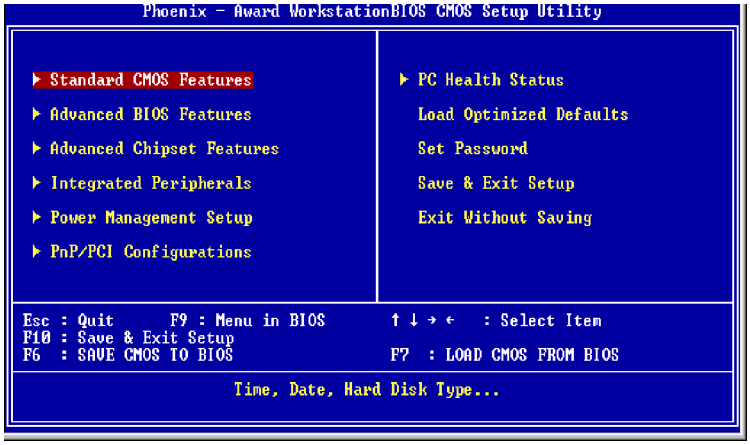
Adress	Description
0000 - 000F	DMA Controller
0000 - 03AF	PCI bus
0010 - 001F	Motherboard Resources
0020 - 0021	PIC
0022 - 003F	Motherboard Resources
0040 - 0043	System Timer
0044 - 005F	Motherboard Resources
0060 - 0060	Keyboard
0061 - 0061	Systems Speaker
0062 - 0063	Motherboard Resources
0064 - 0064	Keyboard
0065 - 006F	Motherboard Resources
0070 - 0073	System CMOS / Real time clock
0074 - 007F	Motherboard Resources

0080 - 0090	DMA Controller
0091 - 0093	Motherboard Resources
0094 - 009F	DMA Controller
00A0 - 00A1	PIC
00A2 - 00BF	Motherboard Resources
00C0 - 00DF	DMA Controller
00E0 - 00EF	Motherboard resources
00F0 - 00FF	Numeric Data Processor
0170 - 0177	Seoncdary IDE Channel
01F0 - 01F7	Primary IDE Channel
0279 - 0279	ISAPNP Read Data Port
0294 - 0297	Motherboard resources
02F4 - 02F7	ISAPNP Read Data Port
02F8 - 02FF	COM2
0376 - 0376	Seoncdary IDE Channel
0378 - 037F	Printer Port
03B0 - 03BB	ATI Technologies Inc. RAGE XL PCI
03B0 - 03DF	PCI bus
03C0 - 03DF	ATI Technologies Inc. RAGE XL PCI
03E0 - 0CF7	PCI bus
03F0 - 03F5	Floppy Disk Controller
03F6 - 03F6	Primary IDE Channel
03F7 - 03F7	Floppy Disk Controller
03F8 - 03FF	C0M1
04D0 - 04D1	Motherboard Resources
0A79 - 0A79	ISAPNP Read Data Port
0D00 - 0FFF	PCI bus
1000 - 3FFF	PCI bus
40F8 - 4FFF	PCI bus
5010 - FFFF	PCI bus
E000 - E0FF	ATI Technologies Inc. RAGE XL PCI
E400 - E43F	Intel 8255x-based PCI Ethernet Adapter (10/100)
E800 - E83F	Intel 8255x-based PCI Ethernet Adapter (10/100) #2
EC00 - EC0F	Standard Dual Channel PCI IDE Controller

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.

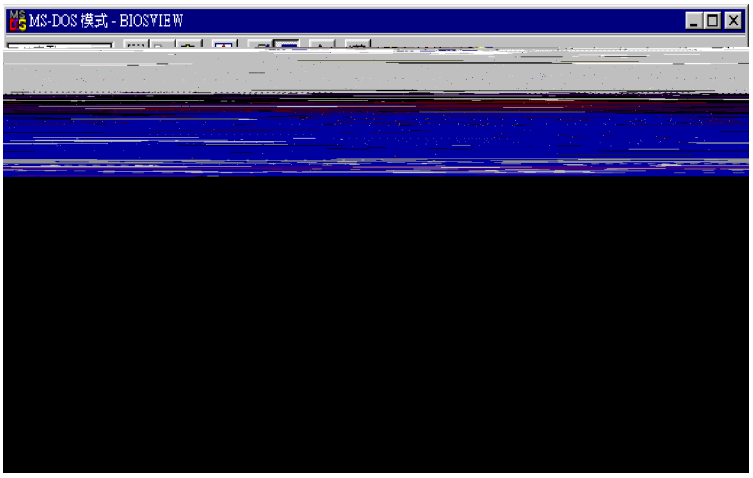
Load Optimized Defaults
Use this menu to load the BIOS default values that are factory settings for optimal performance system operations. While Award has designed the custom BIOS to maximize performance, the factory has the right to change these defaults to meet their needs.

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 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.

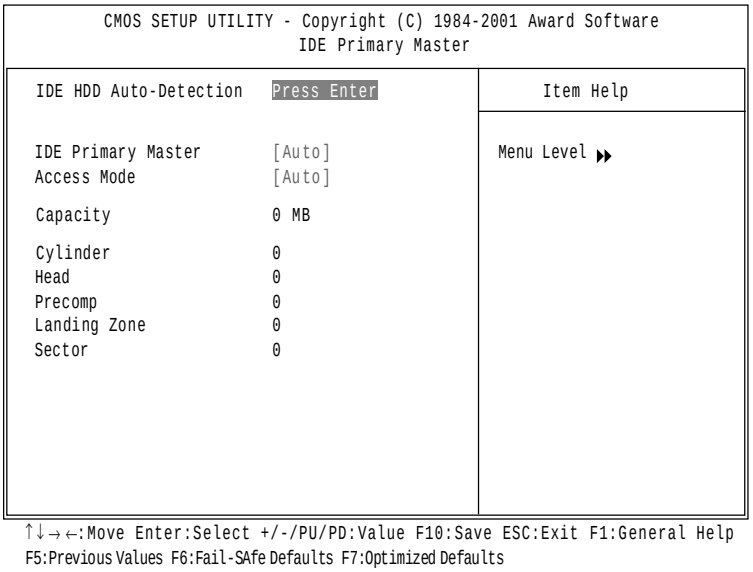
None :	No diskette drive installed
360K ;	5.25 in 5-1/4 inch PC-type standard drive
1.2M ;	5.25 in 5-1/4 inch AT-type high-density drive
720K ;	3.5 in 3-1/2 inch double-sided drive
1.44M ;	3.5 in 3-1/2 inch double-sided drive
2.88M ;	3.5 in 3-1/2 inch double-sided drive

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.

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 Secondary 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.

```
↑↓→←: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, 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.

MSP Version Control For OS
The BIOS supports version 1.4 of the Intel multiprocessor specification. Select the version supported by the operating system running on this computer.

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.

Small Logo(EPA) Show
Select Enabled if your system has a small Logo (EPA) show. If you have no small logo show, select "Disabled" in this field.

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

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

Memory Hole At 15M-16M
You can reserve this area of system memory for ISA adapter ROM. When this area is reserved, it cannot be cached. The user information of peripherals that need to use this area of system memory usually discusses their memory requirement.

ISA IO Cycle Delay
There are four options to be selected. [Full Delay], [1.5 BCLK], [2.5 BCLK] and [3.5 BCLK]

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

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

IDE Function Setup

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.

Onboard Device

Raid Card Boot First
Select "Enable" if your system want to Boot up from the Raid Card.

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

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

Onboard Lan Boot ROM
Select "Enabled" to activate the Lan Boot ROM function

Onboard FDC Controller
Select "Enabled" to activate the on-board FDD
Select "Disabled" to activate an add-on FDD

Onboard Serial Port 1 & 2
Select an address and corresponding interrupt for the first/second serial port. The default value for the first serial port is "3F8/IRQ4" and the second serial port is "2F8/IRQ3".

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

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

Use IR Pins
This item allows you to select IR transmission routes, IR-Rx2Tx2, RxD2 and TxD2.

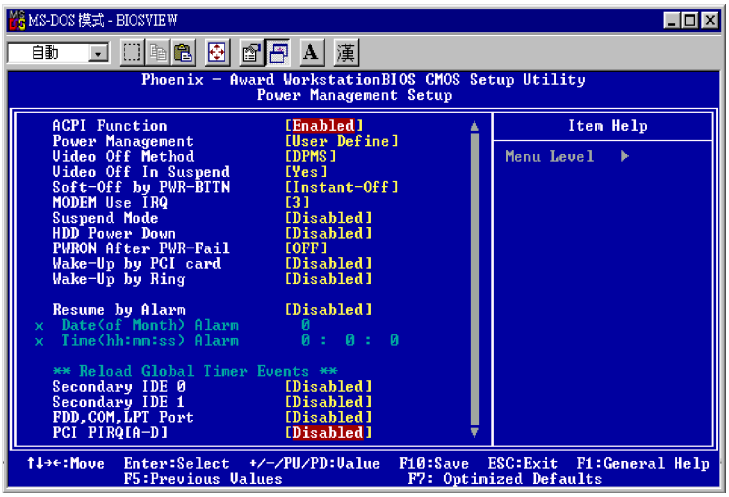
Onboard Parallel Mode
Select an operating mode for the parallel port. Mode options are 3BC/IRQ7, 378/IRQ7, 278/IRQ5, and Disable.

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

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

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

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.

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.HDD Power Down is always set independently

Video Off In Suspend

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

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'.

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.

Suspend Mode
When the suspend mode has been enabled after the selected period of system inactivity, all devices except CPU will be shut down.

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

PWRON after PWR-Fail
There are two options can be selected: [OFF] & [ON].
The default setting is [OFF]

Wake-up by PCI card
An input signal on the PCI card, which awakens the system from a soft off state.

Wake-up by Ring
An input signal on the serial Ring Indicator (RI) line (in other words, an incoming call on the modem) awakens the system from a soft off state.

Resume by Alarm

Wake Up Events

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

Power On by PCI Card

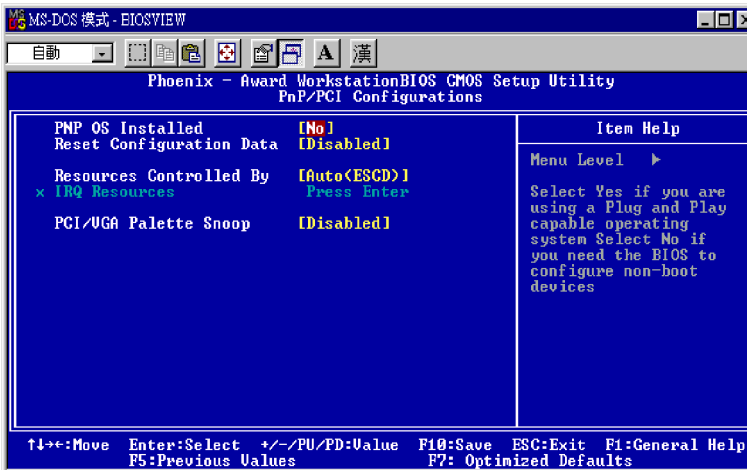
Wake Up on LAN/Ring

RTC Alarm Resume

Date (of Month)

Resume Time (hh:mm:ss)

PnP/PCI Configuration



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

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

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

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

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

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

Legacy ISA Devices compliant with the original PC/AT bus specification, requiring a specific interrupt (such as IRQ4 for serial port 1).

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

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.

PC Health Status

This section describes CPU tempeare for the system.

CPU Warning Temperature
This item allows you to "Enabled" or "Disabled" the CPU Warning Temperature.

Current CPU1 & CPU2 Temperature
These fields display the current CPU temperature, if your computer contains a monitoring system.

Current System Temperature
This field displays the current system temperature.

Current CPUFAN1 & CPUFAN2 Speed
These fields display the current speed of up to three CPU fans, if your computer contains a monitoring system.

Current System FAN Speed
Show you the current SystemFAN operating speed

Vcore1, Vcore2 &Vcc3
These fields display the current voltage of up to seven voltage input lines, if your computer contiains a monitoring system.

VTT
One type of CPU voltage

+2.5V, +5V, +12V
Show you the voltage of +2.5V, +5V, +12V

Shutdown Temperature
This item allows you to set up the CPU shutdown Temperature. This item only effective under windows 98 ACPI mode.

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.

Append A

HPT371 Red Hat Linux Installation Guide

HPT371 UDMA/ATA133 Controller

Red Hat Linux

Installation Guide

Version 1.0

Last updated on Dec 30, 2001

1 Overview

The purpose of this document is to provide clear instructions on how to install and use HPT371 UDMA/ATA133 Controller on Red Hat Linux system.

2 Installing Red Hat Linux on HPT371 Controller

If you would like to install Red Hat Linux onto drives attached to HPT371 controller, please perform the following operations:

Step 1 Prepare Your Hardware for Installation

After you attach your hard disks to HPT371 controller, you can use HPT371 BIOS Setting Utility to configure your hard disks.

Before installation, you must remove all the disk drives, which are not physically attached to HPT371 controller, from your system.

Note

If you have other SCSI adapters installed, you must make sure the HPT371 controller BIOS will be loaded firstly. If not, try to move it to another PCI slot. Otherwise you may be unable to boot up your system.

Step 2 Check System BIOS Settings

In your system BIOS SETUP menu, change **Boot Sequence** in such a way that the system will first boot from floppy or CDROM, and then from SCSI. Refer to your BIOS manual to see how to set boot sequence.

If your BIOS settings do not support such a boot sequence, you can first set it to boot from floppy or CDROM. After you finish installation, set SCSI as the first boot device to boot up the system.

Step 3 Prepare the Driver Diskette

If you are installing Red Hat Linux 7.0/7.1, just copy all the files under rhdd directory to a dos formatted diskette.

If you are installing Red Hat Linux 7.2, the driver is contained in a floppy diskette image file. If you are using an Athlon CPU, the image file is rh72dd-athlon.img, otherwise, the image file is rh72dd-i686.img.

On a DOS or Windows system, you can make the Red Hat 7.2 driver diskette using rawrite.exe. It can be found on the Red Hat Linux CD (under /dosutils). Just run it under a command window and follow its prompt.

On a Linux system, you can use the "dd" command to make the boot diskette. Insert a

floppy disk into the floppy drive and type the command:

for non-Athlon CPU

dd if=rh72dd-i686.img of=/dev/fd0

for Athlon CPU

dd if=rh72dd-athlon.img of=/dev/fd0

Step 4 Install Red Hat Linux

1) Start installing Red Hat Linux by booting with the bootable disks or CDROM.

2) On "**Welcome to Red Hat Linux**" installation screen, a prompted label "**boot:**" will appear at the bottom of the screen. If you are installing Red Hat Linux 7.0/7.1, type in "**expert text**" (without quotation mark) and then press **enter**. If you are installing Red Hat Linux 7.2, type in "**expert text updates**" (without quotation mark) and then press **enter**.

3) If you are installing Red Hat Linux 7.1/7.2, you will be asked "**Do you have a driver disk?**". Select "**Yes**".

4) When prompted "**Insert your driver disk and press OK to continue**", insert the driver diskette in the floppy drive and then select "**OK**".

5) If you are installing Red Hat Linux 7.1/7.2, please **go to step 10** since the system will load HPT371 driver automatically.

6) After the "**Devices**" dialog box appears, select "**Add Device**" option.

7) When asked "**What kind of device would you like to add?**", select "**SCSI**", and then select "**Ok**".

8) Scroll down to "**HPT371 UDMA/ATA133 Controller**", and then select "**Ok**".

9) The installation process will now display the " **HPT371 UDMA/ATA133 Controller**" as been found, select "**Done**".

10) If you are installing Red Hat Linux 7.2, when asked "**Insert your updates disk and press ok to continue**", just press <Enter> to continue.

11) Continue the installation as normal. You can refer to Red Hat Linux installation guide.

Note

The system device mapping order is the same as the order shown in HPT371 BIOS Setting Utility. If you have no other SCSI adapters installed, the device marked as "**BOOT**" or "**HDD0**" will be /dev/sda, "**HDD1**" will be /dev/sdb, "**HDD2**" will be /dev/sdc, etc. When creating mount points, you must mount /boot on /dev/sda.

12) When asked where to install lilo, you must select Master Boot Record (MBR) to make your system be able to boot from HPT371 controller. For Redhat 7.2, you may

choose GRUB as system loader.

3 Installing HPT371 Driver on an Existing System

If you are currently running Linux and would like to access drives or arrays attached to the HPT371 controller, you can perform the following steps.

Note

If you use a SCSI adapter to boot your system, you must make sure the HPT371 controller BIOS will be loaded after that adapter's BIOS. If not, try to move it to another PCI slot. Otherwise you may be unable to boot up your system.

Step 1 Obtain the Driver Module

You can extract the module file from the file modules.cgz on the driver disk. Using the following commands:

```
# mount /dev/fd0
# cd /tmp
# gzip -dc /mnt/floppy/modules.cgz | cpio -idumv
```

Driver modules for different kernel version will be extracted:

/tmp/2.2.16-22/hpt371.o	Red Hat Linux 7.0 driver
/tmp/2.4.2-2/hpt371.o	Red Hat Linux 7.1 driver
/tmp/2.4.7-10/hpt371.o	Red Hat Linux 7.2 driver

Step 2 Test the Driver Module

You can test out the module to ensure that it works for your system by changing working directory to the location where hpt371.o resides and typing in the command "**insmod hpt371.o**".

Sometimes insmod will report "**unresolved symbols**" when you attempt to load the module. This can be caused by two ways:

1) If your system is using a kernel which has not built-in SCSI support, you must load the SCSI module before load hpt371.o. Try to load SCSI modules first.

E.g.
```
# insmod scsi_mod
# insmod sd_mod
# insmod hpt371.o
```

2) If you recompile the kernel with SCSI support and still receive the "**unresolved symbols**" error, it may be caused that you have not configured symbol versioning correctly. To correct it, recompile the kernel with symbol versioning configured. Please refer to the kernel documents for more information.

To ensure the module has been loaded successfully, you can check the driver status by

typing in the command **"cat /proc/scsi/hpt371/x"**, where **x** is the filename you found under /proc/scsi/hpt371/. You should see the driver banner and a list of attached drives. You can now access the drives as a SCSI device (the first device is /dev/sda, then /dev/sdb, etc.).

Example

If you have one disk attached to HPT371, it will be registered to system as device **/dev/sda**. You can use **"fdisk /dev/sda"** to create a partition on it, which will be **/dev/sda1**, and use **"mkfs /dev/sda1"** to setup a file system on the partition. Then you can mount **/dev/sda1** to somewhere to access it.

Step 3 Configure System to Automatically Load the Driver

Most likely, you will not want to type in "**insmod hpt371.o**" each time you boot up the system. Therefore you must install the module and tell the system about it. To install the module, type in the following commands (first change directory to where the proper hpt371.o can be located):

On Red Hat Linux 7.0, use

```
# install -d /lib/modules/2.2.16-22/scsi
# install -c hpt371.o /lib/modules/2.2.16-22/scsi
```

On Red Hat Linux 7.1, use

```
# install -d /lib/modules/2.4.2-2/kernel/drivers/scsi
# install -c hpt371.o /lib/modules/2.4.2-2/kernel/drivers/scsi
```

On Red Hat Linux 7.2, use

```
# install -d /lib/modules/2.4.7-10/kernel/drivers/scsi
# install -c hpt371.o /lib/modules/2.4.7-10/kernel/drivers/scsi
```

Then you should inform the system when to load the module.

1. If you have no other SCSI adapters installed, you can edit the file "**/etc/modules.conf**" and add the following lines:

```
probeall block-major-8 scsi_mod sd_mod hpt371

options –k hpt371
```

This tells the kernel to try loading the SCSI and hpt371 modules whenever it tries to access a SCSI device /dev/sd[a-z]. If you have SCSI support compiled in kernel, you may remove the "scsi_mod" and "sd_mod" from that line.

Notice

Upon your system configuration the modules configuration file may be another file, possibly deprecated "conf.modules" file. You may have to check which configuration file you use and modify the correct one.

Now, reboot the system and try to type in the command "fdisk /dev/sda". The kernel should automatically load the HPT371 driver.

2. If you use a SCSI adapter to boot the system, you cannot do as above since this may conflict with other SCSI devices. However, you can add the driver to the existing RAM disk image. First check which image file you are using by checking the "initrd=" line in file /etc/lilo.conf, the using the following commands (we assume the file is /boot/initrd-2.4.2-2.img. For Redhat 7.2 system, just need to substitute "initrd-2.4.2-2.img" with "initrd-2.4.7-10.img" to get the default RAM disk file name):

 # gzip –dc /boot/initrd-2.4.2-2.img > /tmp/initrd.ext2
 # mkdir /mnt/initrd
 # mount –o loop /tmp/initrd.ext2 /mnt/initrd
 # cp htp371.o /mnt/initrd/lib/ (specify the correct location of hpt371.o here)

Now, add a line "insmod /lib/hpt371.o" to the file /mnt/initrd/linuxrc, just below the line of insmoding SCSI adapter's kernel module. Example of linuxrc:

```
... ...
echo "Loading scsi_mod module"
insmod /lib/scsi_mod.o
echo "Loading sd_mod module"
insmod /lib/sd_mod.o
echo "Loading aic7xxx module"
insmod /lib/aic7xxx.o          ß SCSI adapter's kernel module
insmod /lib/hpt371.o           ß new inserted line echo
"Loading jbd module"
... ...
```

 # umount /mnt/initrd
 # gzip –c /tmp/initrd.ext2 > /boot/initrd-2.4.2-2.img

If you are using Lilo to boot your system, you also need to run lilo:

 # lilo

Then reboot your system and the driver will be loaded.

Step 4 Configure System to Mount Volumes when Startup

Now you can inform the system to automatically mount the array by modifying the file /etc/fstab. E.g. You can add the following line to tell the system to mount /dev/sda1 to location /mnt/hpt after startup:

/dev/sda1 /mnt/hpt ext2 defaults 0 0

4 Monitoring the Driver

Once the driver is running, you can monitor it through the Linux proc file system support. There is a special file under /proc/scsi/hpt371/. Through this file you can view driver status and send control commands to the driver.

Note

The file name is the SCSI host number allocated by OS. If you have no other SCSI cards installed, it will be 0. In the following sections, we will use x to represent this number.

Checking Devices Status

Using the following command to show driver status:

cat /proc/scsi/hpt371/x

This command will show the driver version number, physical device list and logical device list.

5 Updating the Driver

If you are not booting from disks attached to HPT371 controller, you can update the driver just by reinstalling it following the previous section, "**Install HPT371 Driver on an Existing System**".

If you are using a system installed to HPT371 controller, you can update the driver by the following steps.

1) First obtain the new driver module file hpt371.o. Refer to the previous section "**Obtain the Driver Module**". In the following steps, we assume you have copied it to /tmp/hpt371.o.

2) Replace hpt371.o in the boot RAM disk image, /boot/initrd-xxx.img, where xxx is the kernel version. (2.2.16-22 for Red Hat Linux 7.0, 2.4.2-2 for Red Hat Linux 7.1, 2.4.7-10 for Red Hat Linux 7.2)

```
# gzip -dc /boot/initrd-xxx.img > /tmp/initrd.ext2
# mkdir /mnt/initrd
# mount -o loop /tmp/initrd.ext2 /mnt/initrd
# cp /tmp/hpt371.o /mnt/initrd/lib/hpt371.o
# umount /mnt/initrd
# gzip -c /tmp/initrd.ext2 > /boot/initrd-xxx.img
```

3) Use "**lilo**" to reinstall the RAM disk:

```
# lilo
```

4) Update hpt371.o in /lib/modules:

Red Hat Linux 7.0:

 # cp /tmp/hpt371.o /lib/modules/2.2.16-22/scsi/hpt371.o

Red Hat Linux 7.1:

 # cp /tmp/hpt371.o /lib/modules/2.4.2-2/kernel/drivers/scsi/hpt371.o

Red Hat Linux 7.2:

 # cp /tmp/hpt371.o /lib/modules/2.4.7-10/kernel/drivers/scsi/hpt371.o

5) Reboot your system to make the new driver take effect.

6 Uninstalling

Uninstalling the Driver

You can only uninstall the driver when your system is not booting from devices attached to HPT371 controller. Just remove the lines you added to /etc/modules.conf and /etc/fstab.

Contact Information

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