CI7BM Series

Full-Size Socket 370 All-in-one CPU Card

Version 1.0D

Industrial CPU Card

PC-Based Computer Boards for Industrial Automation

User's Manual

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CI7BM Series Comparison Table

Model	CI7BM	CI7BM+	CI7BMV
Processor	Intel Pentium II	Intel Pentium II	Intel Pentium II
Processor Socket	Socket 370	Socket 370	Socket 370
Chipset	Intel 440BX	Intel 440BX	Intel 440BX
BIOS	Award	Award	Award
L2 cache	CPU Integrated	CPU Integrated	CPU Integrated
Max. SDRAM	768MB	768MB	768MB
Memory Sockets	3 x DIMM	3 x DIMM	3 x DIMM
VGA CRT/LCD	C&T 69000	C&T 69000	C&T 69000
Watchdog Timer	16-level	16-level	16-level
PC/104 Connector	yes	Yes	yes
Multi I/O Chip	Winbond 83977	Winbond 83977	Winbond 83977
Enhanced IDE	yes	yes	yes
2S/1P	yes	yes	yes
USB	yes	yes	yes
IrDA	yes	yes	yes
Ultra2 SCSI	no	AIC 7890	no
Audio on board	CT2511	CT2511	no
Ethernet (10/100Mbps)	Intel 82558B	Intel 82558B	no
H/W Monitoring	Winbond W83781D	Winbond W83781D	Winbond W83781D
Board Size	338mm x 122mm	338mm x 122mm	338mm x 122mm

Contents

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Introduction

This manual is designed to give you information on the CI7BM CPU card. It is divided into the following sections:

The topics covered in this chapter are as follows:

◆ Checklist

◆ Description

◆ Features

◆ Specifications

◆ Layout of Key Components and Dimensions

Checklist

Please check that your package is complete and contains the items below.
If you discover damaged or missing items, please contact your dealer.

- The CI7BM Industrial CPU Card
- This User's Manual
- 1 IDE Ribbon Cable
- 1 Floppy Ribbon Connector
- 2 Serial Port Ribbon Cable and 1 Parallel Port Attached to a Mounting Bracket
- One 68-pin Ultra2 SCSI cable (applies for CI7BM+)
- 1 Diskette Containing Intel PCI IDE Driver and Flash Memory Utility
- 2 Diskettes Containing C&T 69000 VGA Driver (applies for CI7BM and CI7BM+)
- 2 Diskettes Containing Intel 82558B LAN Driver (applies for CI7BM and CI7BM+)
- 1 Diskette Containing System Monitor utility
- 1 Optional CD containing *Intel LANDesk Client Manger*
- 4 Diskettes Containing Adaptec Ultra2 SCSI Driver (applies for CI7BM+)
- 8 Diskettes Containing Creative Labs CT2511 Driver (applies for CI7BM, CI7BM+ and CI7BMV)

Description

The CI7BM is an Industrial CPU card based on the Intel 440BX chipset and is fully designed for harsh industrial environment. It features a Socket-370 processor connector that is compatible with Intel Celeron processors. This card accommodates up to 768MB SDRAM configuration.

The CI7BM comes with Winbond's W83781D hardware monitoring device that monitors system and CPU temperature, system voltages, and CPU and chassis fan speeds to prevent system crashes by warning the user of adverse conditions. The power management feature provides power savings by slowing down the CPU clock, turning off the monitor screen and stopping the HDD spindle motor.

Features

- Intel Celeron support *(Coppermine is supported on CI7BM with PCB version 1.10 or above)*

- Bus Speed 66MHz/100MHz

- Intel 440BX AGPset

- Up to 768 SDRAM system memory, ECC function supported

- C&T 69000 VGA chipset for LCD & CRT displays

- Creative Labs CT2511 16-bit audio controller

- Adaptec AIC 7890 Ultra 2 SCSI controller

- COM1 and COM2 serial ports configurable as RS232 and RS232/422/485 respectively

- 16 level programmable watchdog timer, from 0-30 seconds

- High speed bi-directional SPP/ECP/EPP parallel port

- PC/104 extension

- Hardware Monitoring, Windows shut-off, Modem ring-on

- 10/100M Base-T Ethernet interface, Novell NE2000 Compatible

Specifications

- **Processor Socket**: Socket 370 connector

- **Processor**:
  Intel Celeron, 66MHz FSB (Coppermine/100MHz FSB is supported on CI7BM with PCB version 1.10 or above)

- **Chipset**: Intel 440BX AGPset with PCI EIDE and RTC built-in

- **Secondary Cache**: CPU integrated

- **Memory Sockets**:
  Three 168-pin DIMM sockets
  Third DIMM socket optional as 64MB SDRAM on board
  Max. 768MB SDRAM
  Memory type: SDRAM (Synchronous DRAM)
  NOTE: Only SDRAM modules that support SPD (Serial Presence Detect) should be use. Use PC100 modules when running 100MHz CPU bus speed and use PC66/PC100 modules when running 66MHz CPU bus speed.

- **BIOS**: Award BIOS, PnP support
  - FLASH EEPROM (256KB) for BIOS update
  - ISA Plug and Play (PnP) extension
  - Power management

- **DMI BIOS Support**:
  Desktop Management Interface (DMI) allows users to download system hardware-level information such as CPU type, CPU speed, internal/external frequencies and memory size.

- **Multi I/O**: Winbond W83977TF

- **Parallel Port**: One high-speed parallel port, SPP/EPP/ECP mode

- **Serial Port**: Two 16550 UART compatible ports with COM1 as RS232 and COM2 jumper configurable as RS232/422/485

- **Enhanced IDE**: Two Bus Mastering EIDE mode, up to 4 devices, Two EIDE interfaces for up to four devices, support PIO Mode 3/4 or Ultra DMA/33 IDE Hard Disk and ATAPI CD-ROM.

- **FDD Interface**: Two floppy drives (360KB, 720KB, 1.2MB, 1.44MB, 2.88MB, LS-120)

- **CRT/LCD**: C&T 69000 chipset
  - Embedded 2MB SDRAM display memory
  - Simultaneous CRT & LCD display
  - LCD panel supports DSTN/TFT
  - 1280x1024x8bpp colors CRT resolution
  - Up to 1280x1024x8bpp colors resolution for color active matrix TFT panels (12, 18, and 24bit analog) or (12+12), (18+18) double pixel/CLK interface

- **USB Interface**: Two USB pin-header connectors, compliant with USB Specification Rev. 1.0

- **DiskOnChip**: The M-Systems flask disk supports system boot and storage capacity from 2MB to 72MB.

- **Watchdog Timer**: 16-level, programmable
  - I/O port 0443H to enable watchdog.
  - I/O port 0441H to disable watchdog.
  - Time-out timing select 0/2/4/6/8/10/12/14/16/18/20/22/ 24/26/28/30 seconds (+/-20%).

- **Green Function**: Power management via BIOS, activated through mouse/keyboard movement

- **Ultra2 SCSI**: The Adaptec AIC-7890 is a 32-bit single-chip host adapter delivering Ultra2 SCSI data transfer rates up to 40Mbyte/sec in 8-bit mode and 80Mbyte/sec in 16-bit mode to address emerging bandwidth-hungry applications, such as real-time video, data mining, and scientific modeling and simulation.

- **PCI Bus Ethernet Interface**: Intel 82558B chipset
  - PCI local bus Ethernet controller
  - Supports IEEE802.3u auto-negotiation for automatic speed selection
  - support 10/100Mbps operation in a single port PCI bus master architecture

- **Keyboard and Mouse Connectors**: PS/2 type mini-DIN that supports PC/AT; supports a 5-pin external keyboard connector

- **IrDA Interface**: Pin-header connector for the optional IrDA external connector

- **PICMG Compliance**: Fully compliant to PICMG standards

- **Environmental and Mechanical**:
  - **Power Supply**: 10A @+5V(max), ±12V:100mA(max)
  - **Temperature**: 0°C to 60°C
  - **Humidity**: 5% to 95%
  - **Dimensions**: 338mm x 122mm

Intelligence

- **Temperature Monitoring and Alert**: A sensor for the CPU temperature on the CI7BM monitors the CPU temperature and alerts the user through the speaker or buzzer when temperature exceeds the safe heat level.

- **Windows 95 shut-off:** Allows shut-off control from within Windows 95 and through an ATX power supply.

- **Modem ring-on:** Allows system powering on through an external modem and through an ATX power supply.

- **Year 2000 Compliant BIOS**: The onboard Award BIOS is Year 2000 Compliant and will pass software applications that have the tendency to invoke INT1AH function 04H such as year2000.exe utility released by NSTL.

- **Wake On LAN**: Through an ATX power supply and network connection, systems can be turned on from the power-off state.

Board Dimensions
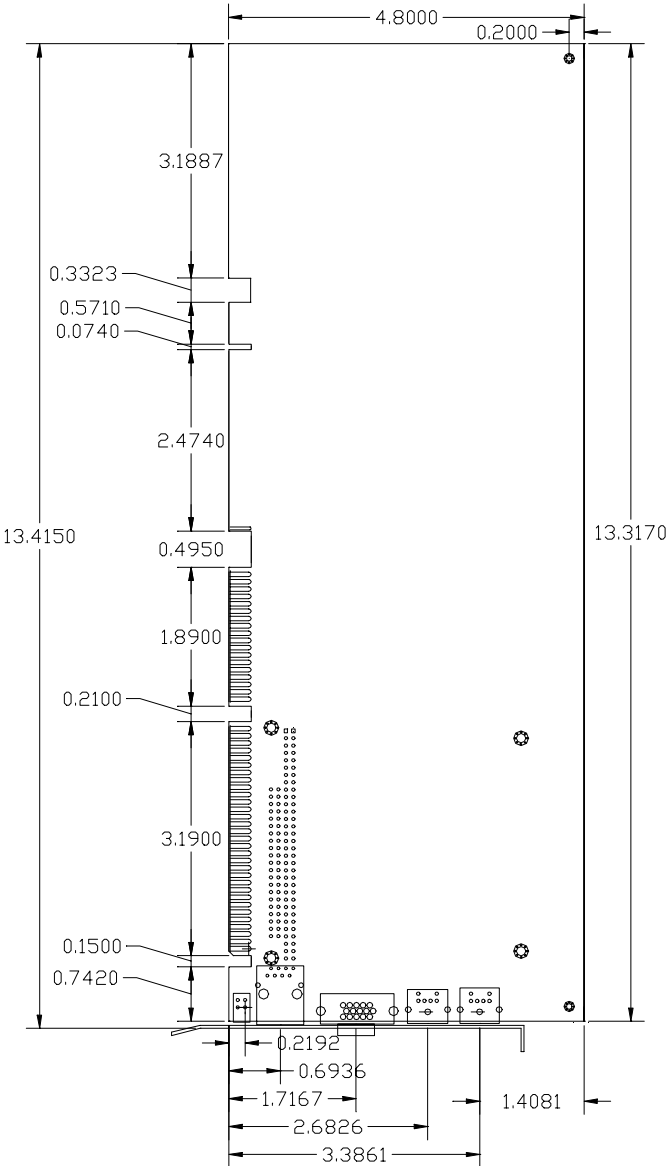
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Installations

This chapter provides information on how to use the jumpers and connectors on the CI7BM in order to set up a workable system. The topics covered are:

CPU Installation

The CI7BM Industrial CPU Card supports a Socket 370 connector processor socket for Intel Celeron processors.

The Socket 370 connector comes with a lever to secure the processor. Before inserting the CPU, make sure the lever is raised perpendicular to the socket and the notch on the corner of the CPU corresponds with the notch on the inside of the socket.

After you have installed and lock the processor into place, check if the jumpers for the CPU type and speed are correct.

NOTE: *Ensure that the CPU heat sink and the CPU top surface are in total contact to avoid CPU overheating problem that would cause your system to hang or be unstable.*

Memory Installation

The CI7BM Industrial CPU Card supports two three 168-pin DIMM sockets for a maximum total memory of 768 SDRAMs. A manufacturing option replaces the DIMM3 socket as 64MB SDRAM memory on board. The memory modules can come in sizes of 16MB, 32MB, 64MB, 128MB and 256MB SDRAMs.

In populating the DIMM sockets, any of the DIMM banks can be populated first. Refer to the following table on how to configure the memory.

NOTE: *Use SDRAM modules with PC100 specification when running 100MHz CPU bus speed. With 66MHz CPU bus speed, SDRAM modules with PC66 or PC100 specification can be used. You have to install the Pentium II processor before installing the memory modules.*

168-pin DIMM (3.3V) Unbuffer SDRAM

Bank0 (DIMM3)	Bank1 (DIMM2)	Bank2 (DIMM1)	Total Memory
8MB	-----	-----	8MB
16MB	-----	-----	16MB
32MB	-----	-----	32MB
64MB	-----	-----	64MB
128MB	-----	-----	128MB
8MB	8MB	-----	16MB
16MB	8MB	-----	24MB
32MB	8MB	-----	40MB
64MB	8MB	-----	72MB
128MB	8MB	-----	136MB
8MB	8MB	8MB	24MB
16MB	8MB	8MB	32MB
32MB	8MB	8MB	48MB
64MB	8MB	8MB	80MB
128MB	8MB	8MB	144MB
16MB	16MB	-----	32MB
32MB	16MB	-----	48MB
64MB	16MB	-----	80MB
128MB	16MB	-----	144MB

Bank0 (DIMM3)	Bank1 (DIMM2)	Bank2 (DIMM1)	Total Memory
16MB	16MB	8MB	40MB
32MB	16MB	8MB	56MB
64MB	16MB	8MB	88MB
128MB	16MB	8MB	152MB
16MB	16MB	16MB	48MB
32MB	16MB	16MB	64MB
64MB	16MB	16MB	96MB
128MB	16MB	16MB	160MB
32MB	32MB	-----	64MB
64MB	32MB	-----	96MB
128MB	32MB	-----	160MB
32MB	32MB	8MB	72MB
64MB	32MB	8MB	104MB
128MB	32MB	8MB	168MB
32MB	32MB	16MB	80MB
64MB	32MB	16MB	112MB
128MB	32MB	16MB	176MB
32MB	32MB	32MB	96MB
64MB	32MB	32MB	128MB
128MB	32MB	32MB	192MB
64MB	64MB	-----	128MB
128MB	64MB	-----	192MB
64MB	64MB	8MB	136MB
128MB	64MB	8MB	200MB
64MB	64MB	16MB	144MB
128MB	64MB	16MB	208MB
64MB	64MB	32MB	160MB
128MB	64MB	32MB	224MB
64MB	64MB	64MB	192MB
128MB	64MB	64MB	256MB
128MB	128MB	-----	320MB
128MB	128MB	8MB	264MB
128MB	128MB	16MB	272MB
128MB	128MB	32MB	288MB
128MB	128MB	64MB	320MB
128MB	128MB	128MB	384MB

Jumpers on the CI7BM

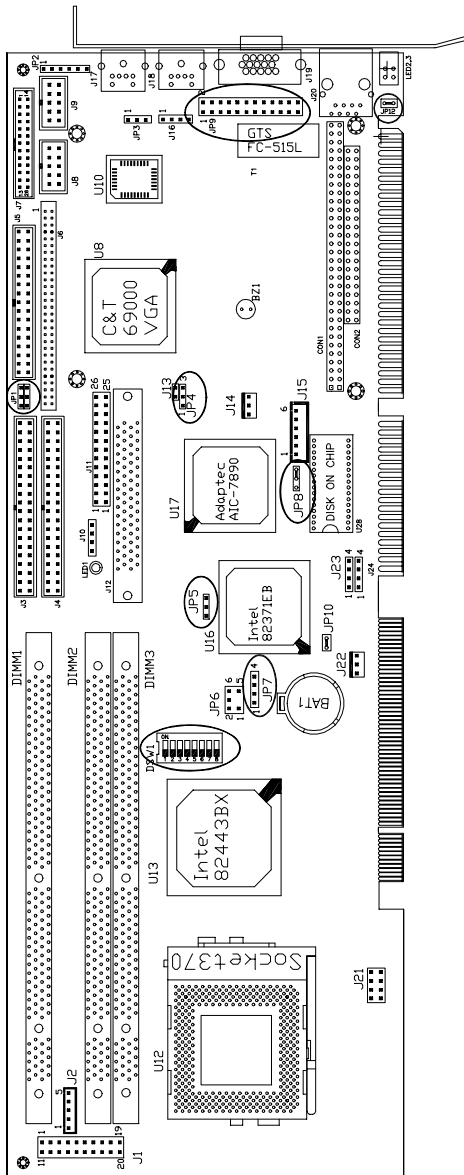The jumpers on the CI7BM allow you to configure your CPU card according to the needs of your applications. If you have doubts about the best jumper configuration for your needs, contact your dealer or sales representative. The following table lists the connectors on CI7BM and their respective functions.

NOTE: Jumpers J16 and J21 are for manufacturer testing use only.

Jumper Locations on the CI7BM

DSW1 (3): CPU Bus Speed Selector

Bus Speed	DSW1 (3)	Bus Speed	DSW1 (3)
100MHz	off	66MHz	on

DSW1 (5-8): CPU Frequency Selector

The table below shows the correct settings to match the CPU frequency.

Frequency Multiplier	CPU Frequency (66MHz)	CPU Frequency (100MHz)	DSW1(5-8)
4.5X	300MHz	450MHz	xx xx xx xx on off off on
5X	333MHz	500MHz	xx xx xx xx off on on on
5.5X	366MHz	550MHz	xx xx xx xx off off off on
6X	400MHz	600MHz	xx xx xx xx on on on off
6.5X	433MHz	650MHz	xx xx xx xx on on off off
7X	466MHz	700MHz	xx xx xx xx on off off on
7.5X	500MHz	750MHz	xx xx xx xx on off off off
8X	533MHz	800MHz	xx xx xx xx off on on off

Note: The settings for 650MHz, 700MHz, 750MHz, and 800MHz frequencies are for reference only. As of the time of the printing of this page, these CPUs were not available for testing and are not guaranteed to work properly on the CPU card.

JP1: LCD Power Setting

The CI7BM XGA interface supports 5V and 3.3V LCD displays. Use JP1 to change between 5V (*default*) and 3.3V panel video signal level.

3.3V Setting	5V Setting
2 4 6	2 4 6
1 3 5	1 3 5
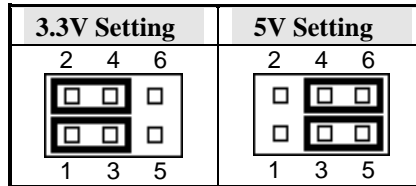
JP4: DiskOnChip BIOS Expansion Address Select

JP4	Address
1 ☐☐ ☐ 3	D0000-D7FFF
1 ☐ ☐☐ 3	D8000-DFFFF (default)

JP5: Clear CMOS Content

JP5	Setting	Function
1 ☐ ☐☐ 3	Pin 2-3 Short/Closed	Clear CMOS Content
1 ☐☐ ☐ 3	Pin 1-2 Short/Closed	Normal Operation

JP7: External Battery Connector

JP7connects to an external battery to maintain the information stored in the CMOS RAM in case the built-in battery malfunctions.

1 ☐ ☐ ☐☐ 4
Internal Battery (default)

1 ☐ ☐ ☐ ☐ 4
External Battery

Pin #	Signal Name
1	Vcc
2	N.C.
3	Battery GND
4	Ground
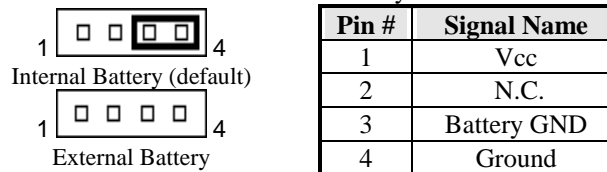
JP8: On Board VGA Enable/Disable

The on board VGA jumper, by default, is set to *VGA Enable* (pin 1-2 short). To disable the VGA, short pin 2-3.

JP9: RS232/422/485 (COM2) Selection

COM1 is fixed for RS-232 use only.
COM2 is selectable for RS232, RS-422 and RS-485.
The following table describes the jumper settings of this connector.

COM2 Function	RS-232	RS-422	RS-485
Jumper Setting (pin closed)	all jumpers open	1-2 3-4 5-6 7-8 11-12 15-16 17-18 19-20 23-24	1-2 3-4 5-6 7-8 9-10 11-12 13-14 15-16 17-18 19-20 21-22
Jumper Illustration	JP9	JP9	JP9

JP12: On Board LAN Enable/Disable
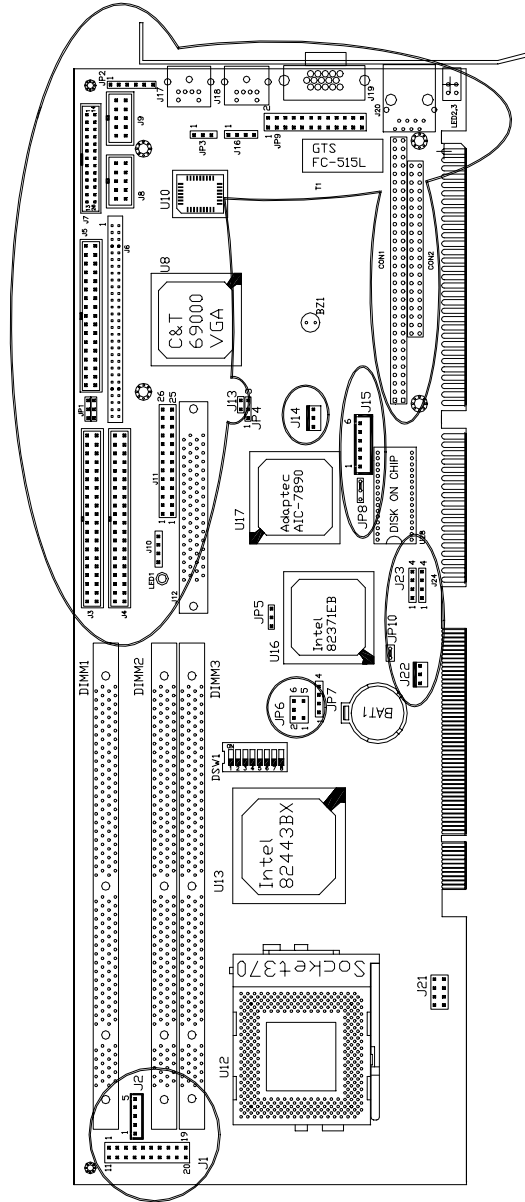
JP12	Setting	On Board LAN
□ □	Open	Enable
▣ □	Short	Disable

Connectors on the CI7BM

The connectors on the CI7BM allows you to connect external devices such as keyboard, floppy disk drives, hard disk drives, printers, etc. The following table lists the connectors on CI7BM and their respective functions.
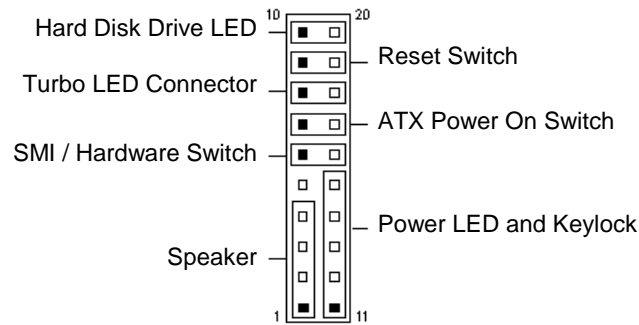
Connector Locations on the CI7BM

J1: Front Bezel Connector

The front bezel of the case has a control panel that provides light indication of the computer activities and switches to change the computer status. J1 is a 20-pin header that provides interfaces for the following functions.

Hard Disk Drive LED
Turbo LED Connector
SMI / Hardware Switch
Speaker

Reset Switch
ATX Power On Switch
Power LED and Keylock

Speaker: Pins 1 - 4
This connector provides an interface to a speaker for audio tone generation. An 8-ohm speaker is recommended.
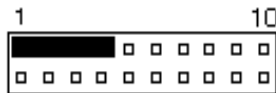
Pin #	Signal Name
1	Speaker out
2	No connect
3	Ground
4	+5V

Power LED and Keylock: Pins 11 - 15
The power LED indicates the status of the main power switch. The keylock switch, when closed, will disable the keyboard function.

Pin #	Signal Name
11	Power LED
12	No connect
13	Ground
14	Keylock
15	Ground

SMI/Hardware Switch: Pins 6 and 16

This connector supports the "Green Switch" on the control panel, which, when pressed, will force the system into the power-saving mode immediately.
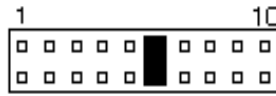
Pin #	Signal Name
6	Sleep
16	Ground

ATX Power ON Switch: Pins 7 and 17

This 2-pin connector is an "ATX Power Supply On/Off Switch" on the system that connects to the power switch on the case. When pressed, the power switch will force the system to power on. When pressed again, it will force the system to power off.

Turbo LED Connector: Pins 8 and 18

There is no turbo/deturbo function on the CPU card. The Turbo LED on the control panel will always be On when attached to this connector.
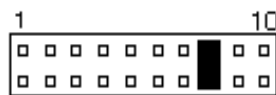
Pin #	Signal Name
8	5V
18	Ground

Reset Switch: Pins 9 and 19

The reset switch allows the user to reset the system without turning the main power switch off and then on again. Orientation is not required when making a connection to this header.
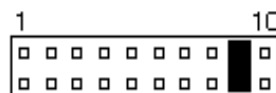
Hard Disk Drive LED Connector: Pins 10 and 20
This connector connects to the hard drive activity LED on control panel. This LED will flash when the HDD is being accessed.
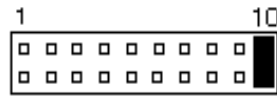
Pin #	Signal Name
10	Ground
20	5V

J2: External Keyboard Connector

Pin #	Signal Name
1	Keyboard clock
2	Keyboard data
3	NC
4	GND
5	Vcc

JP2: IrDA Connector

This connector is used for an IrDA connector for wireless communication.

+5V   IRTX   IRRX

N.C.   GND
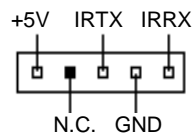
Pin #	Signal Name
1	+5V
2	No connect
3	Ir TX
4	Ground
5	Ir RX

J3, J4: EIDE Connectors

J3: Primary IDE Connector
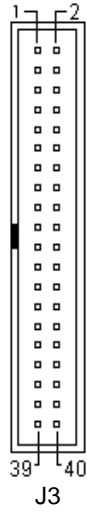
Signal Name	Pin #	Pin #	Signal Name
Reset IDE	1	2	Ground
Host data 7	3	4	Host data 8
Host data 6	5	6	Host data 9
Host data 5	7	8	Host data 10
Host data 4	9	10	Host data 11
Host data 3	11	12	Host data 12
Host data 2	13	14	Host data 13
Host data 1	15	16	Host data 14
Host data 0	17	18	Host data 15
Ground	19	20	Key
DRQ0	21	22	Ground
Host IOW	23	24	Ground
Host IOR	25	26	Ground
IOCHRDY	27	28	Host ALE
DACK0	29	30	Ground
IRQ14	31	32	No connect
Address 1	33	34	No connect
Address 0	35	36	Address 2
Chip select 0	37	38	Chip select 1
Activity	39	40	Ground

J3

J4: Secondary IDE Connector
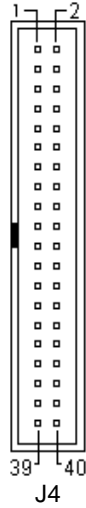
Signal Name	Pin #	Pin #	Signal Name
Reset IDE	1	2	Ground
Host data 7	3	4	Host data 8
Host data 6	5	6	Host data 9
Host data 5	7	8	Host data 10
Host data 4	9	10	Host data 11
Host data 3	11	12	Host data 12
Host data 2	13	14	Host data 13
Host data 1	15	16	Host data 14
Host data 0	17	18	Host data 15
Ground	19	20	Key
DRQ1	21	22	Ground
Host IOW	23	24	Ground
Host IOR	25	26	Ground
IOCHRDY	27	28	Host ALE
DACK1	29	30	Ground
IRQ15	31	32	No connect
Address 1	33	34	No connect
Address 0	35	36	Address 2
Chip select 0	37	38	Chip select 1
Activity	39	40	Ground

JP3: Wake On LAN Connector

JP3 is a 3-pin header for the Wake On LAN function on the CPU card.
The following table shows the pin out assignments of this connector.
Wake On LAN will function properly only with an ATX power supply
with 5VSB that has 200mA.
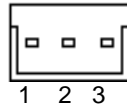
Pin #	Signal Name
1	+5VSB
2	Ground
3	Wake on LAN

J5: Floppy Drive Connector

J5 is a 34-pin header and will support up to 2.88MB floppy drives.
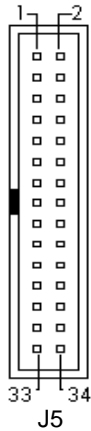
Signal Name	Pin #	Pin #	Signal Name
Ground	1	2	RM/LC
Ground	3	4	No connect
Ground	5	6	No connect
Ground	7	8	Index
Ground	9	10	Motor enable 0
Ground	11	12	Drive select 1
Ground	13	14	Drive select 0
Ground	15	16	Motor enable 1
Ground	17	18	Direction
Ground	19	20	Step
Ground	21	22	Write data
Ground	23	24	Write gate
Ground	25	26	Track 00
Ground	27	28	Write protect
Ground	29	30	Read data
Ground	31	32	Side 1 select
Ground	33	34	Diskette change

JP6: SB-Link Connector

The following table shows the pin out assignments of this connector. This connector is used for the Creative Sound AWE64D PCI sound card. The SB-Link uses Intel's PC-PCI technology to deliver (Creative's) Sound Blaster 16 compatibility to AWE64D, enabling users to play Real-mode DOS games.
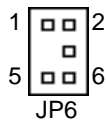
JP6 Pin #	Signal Name
1	GNTA#
2	Ground
3	No Connect
4	REQA#
5	Ground
6	SERIRQ#

J6: Flat Panel LCD Connector

J6 is a 58-pin (dual in line header) for flat panel LCD displays. The following shows the pin assignments of this connector.
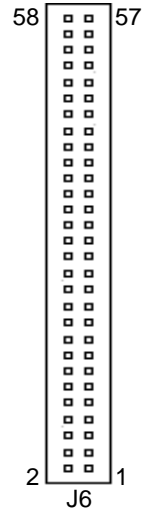
Signal Name	Pin #	Pin #	Signal Name
+12V	1	2	+12V
GND	3	4	GND
+5V/3.3V	5	6	+5V/3.3V
ENPVEE	7	8	GND
PD0	9	10	PD1
PD2	11	12	PD3
PD4	13	14	PD5
PD6	15	16	PD7
PD8	17	18	PD9
PD10	19	20	PD11
PD12	21	22	PD13
PD14	23	24	PD15
PD16	25	26	PD17
PD18	27	28	PD19
PD20	29	30	PD21
PD22	31	32	PD23
GND	33	34	GND
SHFCLK	35	36	FLM
M	37	38	LP
GND	39	40	ENABKL
GND	41	42	ASCLK
ENAVDD	43	44	+5V/3.3V
NC	45	46	NC
PD24	47	48	PD25
PD26	49	50	PD27
PD28	51	52	PD29
PD30	53	54	PD31
PD32	55	56	PD33
PD34	57	58	PD35

58 □ □ 57
2 □ □ 1
J6

Flat Panel Display Interface Pin Descriptions

Pin Name	Mono SS 8-bit	Mono DD 8-bit	Mono DD 16-bit	Color TFT 9/12/16 bit	Color TFT 18/24 bit	Color TFT 36-bit	Color TFT 18/24 bit	Color TFT+HR 8-bit (4bP)	Color STN-SS 16-bit (4bP)	Color STN-SS 8-bit (4bP)	Color STN-DD 16-bit (4bP)	Color STN-DD 24-bit
P0	D0	UD3	UD7	B0	B0	FB0	FB0	R1	R1	UR1	UR0	UR0
P1	D1	UD2	UD6	B1	B1	FB1	FB1	B1	G1	UG1	UG0	UG0
P2	D2	UD1	UD5	B2	B2	FB2	FB2	G2	B1	UB1	UB0	UB0
P3	D3	UD0	UD4	B3	B3	FB3	FB3	B3	R2	UB2	UR1	LR0
P4	D4	LD3	UD3	B4	B4	FB4	SB0	G4	G3	LR1	LR0	LG0
P5	D5	LD2	UD2	G0	B5	FB5	SB1	R5	B2	LG1	LG0	LB0
P6	D6	LD1	UD1	G1	B6	SB0	SB2	B5	R3	LB1	LB0	UR1
P7	D7	LD0	UD0	G2	B7	SB1	B3		G3	LR2	LR1	UG1
P8			LD7	G3	G0	SB2	FG0		B3		UG1	UB1
P9			LD6	G4	G1	SB3	FG1		R4		UB1	LR1
P10			LD5	G5	G2	SB4	FG2		G4		UR2	LG1
P11			LD4	R0	G3	SB5	FG3		B4		UG2	LB1
P12			LD3	R1	G4	FG0	SG0		R5		LG1	UR2
P13			LD2	R2	G5	FG1	SG1		G5		LB1	UG2
P14			LD1	R3	G6	FG2	SG2		B5		LR2	UB2
P15			LD0	R4	G7	FG3	SG3		G6		LG2	LR2
P16					R0	FG4	FR0					LG2
P17					R1	FG5	FR1					LB2
P18					R2	SG0	FR2					UR3
P19					R3	SG1	FR3					UG3
P20					R4	SG2	SR0					LR3
P21					R5	SG3	SR1					LG3
P22					R6	SG4	SR2					LB3
P23					R7	SG5	SR3					
P24							FR0					
P25							FR1					
P26							FR2					
P27							FR3					
P28							FR4					
P29							FR5					
P30							SR0					
P31							SR1					
P32							SR2					
P33							SR3					
P34							SR4					
P35							SR5					
SHFCLK	SHFCLK	SHFCLK	SHFCLK	SHFCLK	SHFCLK	SHFCLK	SHFCLK	SHFCLK	SHFCLK	SHFCLK	SHFCLK	SHFCLK
Pixels/Clk:	8	8	16	1	1	2	2	2-2/3	5-1/3	2-2/3	5-1/3	8

J7: Parallel Port Connector

The following table describes the pin out assignments of this connector.
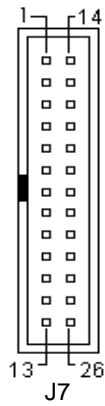
Signal Name	Pin #	Pin #	Signal Name
Line printer strobe	1	14	AutoFeed
PD0, parallel data 0	2	15	Error
PD1, parallel data 1	3	16	Initialize
PD2, parallel data 2	4	17	Select
PD3, parallel data 3	5	18	Ground
PD4, parallel data 4	6	19	Ground
PD5, parallel data 5	7	20	Ground
PD6, parallel data 6	8	21	Ground
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

J8: COM1 Serial Port

J8, a 10-pin header connector, is an onboard serial port of the CI7BM. The following table shows the pin assignments of this connector.
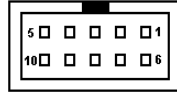
Pin #	Signal Name
1	DCD, Data carrier detect
2	RXD, Receive data
3	TXD, Transmit data
4	DTR, Data terminal ready
5	GND, ground
6	DSR, Data set ready
7	RTS, Request to send
8	CTS, Clear to send
9	RI, Ring indicator
10	NC

J8: COM1

J9: COM2 Serial Port

J9, a 10-pin header connector, is the onboard COM2 serial port of the CI7BM. The following table shows its pin assignments.
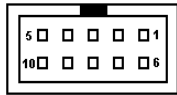
Pin #	Signal Name		
	RS-232	**R2-422**	**RS-485**
1	DCD	TX-	DATA-
2	RX	TX+	DATA+
3	TX	RX+	NC
4	DTR	RX-	NC
5	GND	GND	GND
6	DSR	RTS-	NC
7	RTS	RTS+	NC
8	CTS	CTS+	NC
9	RI	CTS-	NC
10	NC	NC	NC

J9: COM2

J10: External SCSI HDD LED

The SCSI HDD activity LED flashes when the HDD is being accessed.

Pin #	Signal Name
1	LED+
2	LED-
3	LED-
4	LED+

J10

J11: Audio I/O Connector
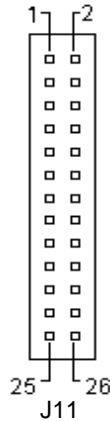
Signal Name	Pin #	Pin #	Signal Name
+12V	1	2	-12V
GND	3	4	Out-R
Out-L	5	6	GND
Auxi-L	7	8	Auxi-R
GND	9	20	Line-R
Line-L	11	12	GND
NC	13	14	NC
Vcc	15	16	MIC
RxD	17	18	TXD
GP7	19	20	GP6
GP5	21	22	GP4
GP3	23	24	GP2
GP1	25	26	GP0

J11

The J11 Audio I/O Connector connects to the EXTVGM Audio Daughter Card with the 26-pin ribbon cable supplied with the package. The EXTVGM Audio Daughter card provides two CD-AUDIO IN internal connectors and external connectors for LINE OUT, LINE IN, MICROPHONE, and JOYSTICK/MIDI. Refer to the figure below.

EXTVGM AUDIO DAUGHTER CARD
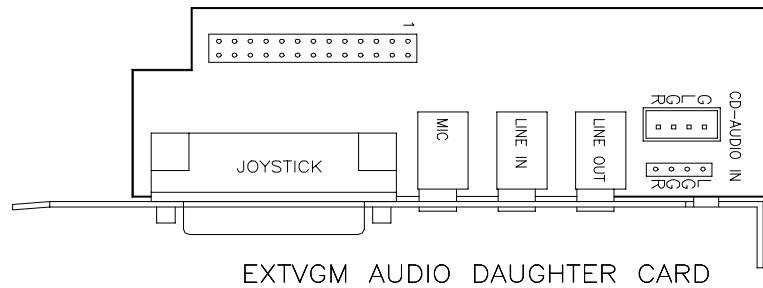
J12: Ultra2 SCSI Connector

The table below shows the pin-out assignments of this 68-pin connector.
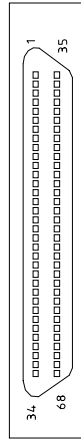
Signal Name	Pin #	Pin #	Signal Name
LVDP12	1	35	LVDM12
LVDP13	2	36	LVDM13
LVDP14	3	37	LVDM14
LVDP15	4	38	LVDM15
LVDPHP	5	39	LVDPHM
LVDP0	6	40	LVDM0
LVDP1	7	41	LVDM1
LVDP2	8	42	LVDM2
LVDP3	9	43	LVDM3
LVDP4	10	44	LVDM4
LVDP5	11	45	LVDM5
LVDP6	12	46	LVDM6
LVDP7	13	47	LVDM7
LVDPLP	14	48	LVDPLM
GROUND	15	49	GROUND
DFFSENSE	16	50	LVEXT68
GROUND	17	51	LVTRMPWR
LVTRMPWR	18	52	LVTRMPWR
LVTRMPWR	19	53	N.C.
GROUND	20	54	GROUND
LVATNP	21	55	LVATNM
GROUND	22	56	GROUND
LVBSYP	23	57	LVBSYM
LVACKP	24	58	LVACKM
LVRSTP	25	59	LVRSTM
LVMSGP	26	60	LVMSGM
LVSELP	27	61	LVSELM
LVCDP	28	62	LVCDM
LVREQP	29	63	LVREQM
LVIOP	30	64	LVIOM
LVDP8	31	65	LVDM8
LVDP9	32	66	LVDM9
LVDP10	33	67	LVDM10
LVDP11	34	68	LVDM11

J12

J14: Chassis Fan Power Connector

J14 is a 3-pin header for the chassis fan. The fan must be a 12V fan.
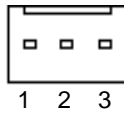
Pin #	Signal Name
1	Rotation
2	+12V
3	Ground

J15: External ATX Power Connector

Pin #	Signal Name
1	N.C.
2	GND
3	N.C.
4	GND
5	PS-ON (soft on/off)
6	5V SB (standby +5V)

J17: PS/2 Keyboard Connector
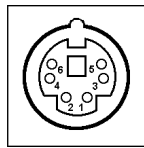
Pin #	Signal Name
1	Keyboard data
2	N.C.
3	GND
4	5V
5	Keyboard clock
6	N.C.

J18: PS/2 Mouse Connector
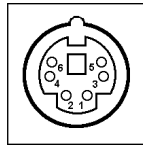
Pin #	Signal Name
1	Mouse data
2	N.C.
3	N.C.
4	5V
5	Mouse Clock
6	N.C.

J18

J19: VGA CRT Connector

The pin assignments of the J19 VGA CRT connector are as follows:
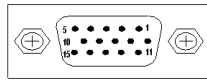
Signal Name	Pin	Pin	Signal Name
Red	1	2	Green
Blue	3	4	N.C.
GND	5	6	GND
GND	7	8	GND
N.C.	9	10	GND
N.C.	11	12	N.C.
HSYNC	13	14	VSYNC
NC	15		

J19

J20: RJ45 Connector

This connector is for the 10/100Mbps Ethernet capability of the CPU card. The figure below shows the pin out assignments of this connector and its corresponding input jack.

TD+(pin#1)
TD-(pin#2)
RD+(pin#3)

RD-(pin#6)
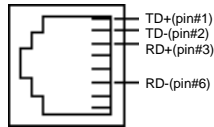
J20

J22: CPU Fan Power Connector

J22 is a 3-pin header for the CPU fan. The fan must be a 12V fan.
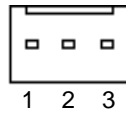
Pin #	Signal Name
1	Rotation
2	+12V
3	Ground

J23, J24: USB Connectors

The following table shows the pin outs of the USB connectors.
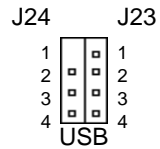
J24 Pin #	J23 Pin #	Signal Name
1	1	Vcc
2	2	USB-
3	3	USB+
4	4	Ground

CON1, CON2: PC-104 Connector

CON1 and CON2 are dual-in-line pin headers that support PC-104 modules. CON1 consists of 64 pins and CON2 has 40 pins. The following table shows the their pin assignments.

CON1				CON2			
Pin	Signal Name	Pin	Signal Name	Pin	Signal Name	Pin	Signal Name
A1	IOCHK	B1	GND	C1	GND	D1	GND
A2	D7	B2	REST	C2	SBHE	D2	MEMCS16
A3	D6	B3	VCC	C3	LA23	D3	IOCS16
A4	D5	B4	IRQ9	C4	LA22	D4	IRQ10
A5	D4	B5	-5V	C5	LA21	D5	IRQ11
A6	D3	B6	DRQ2	C6	LA20	D6	IRQ12
A7	D2	B7	-12V	C7	LA19	D7	IRQ15
A8	D1	B8	OWS	C8	LA18	D8	IRQ14
A9	D0	B9	+12V	C9	LA17	D9	DACK0
A10	IOCHRDY	B10	GND	C10	MEMR	D10	DRQ0
A11	AEN	B11	SMEMW	C11	MEMW	D11	DACK5
A12	A19	B12	SMEMR	C12	D8	D12	DRQ5
A13	A18	B13	IOW	C13	D9	D13	DACK6
A14	A17	B14	IOR	C14	D10	D14	DRQ6
ZA15	A16	B15	DACK3	C15	D11	D15	DACK7
A16	A15	B16	DRQ3	C16	D12	D16	DRQ7
A17	A14	B17	DACK1	C17	D13	D17	VCC
A18	A13	B18	DRQ1	C18	D14	D18	MASTER
A19	A12	B19	REFRESH	C19	D15	D19	GND
A20	A11	B20	CLK	C20	KEY PIN	D20	GND
A21	A10	B21	IRQ7				
A22	A9	B22	IRQ6				
A23	A8	B23	IRQ5				
A24	A7	B24	IRQ4				
A25	A6	B25	IRQ3				
A26	A5	B26	DACK2				
A27	A4	B27	TC				
A28	A3	B28	BALE				
A29	A2	B29	VCC				
A30	A1	B30	OSC				
A31	A0	B31	GND				
A32	GND	B32	GND				
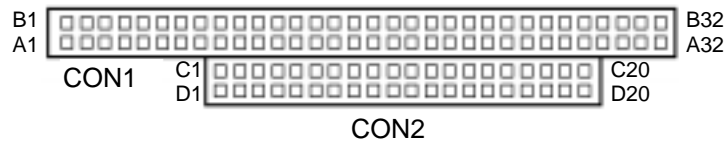
LED1: Internal SCSI HDD LED

Just on top of the Ultra2 SCSI connector is LED1, the internal SCSI HDD LED, that flashes when there is activity on the SCSI hard disk.

LED2, LED3: LAN Activity Indicators

LED2and LED3 are orange and yellow LED indicators located at the bracket side of the CPU card that shows LAN activity and the transfer rate in progress. Refer to the following table for the functions of each LED status.

LED2 (yellow) Status	Function	LED3 (green) Status	Function
ON	Data transfer in progress	OFF	10Mbps transfer rate
OFF	Data transfer off (Link off)	ON	100Mbps transfer rate

Watchdog Timer Configuration

The function of the watchdog timer is to reset the system automatically and is defined at I/O port 0443H. To enable the watchdog timer and allow the system to reset, write I/O port 0443H. To disable the timer, write I/O port 0441H for the system to stop the watchdog function. The timer has a tolerance of 20% for its intervals.

The following describes how the timer should be programmed.

Enabling Watchdog:
MOV   AX, 000FH (Choose the values from 0)
MOV   DX, 0443H
OUT   DX, AX

Disabling Watchdog
MOV   AX, 00FH (Any value is fine.)
MOV   DX, 0441H
OUT   DX, AX

WATCHDOG TIMER CONTROL TABLE

Level	Value	Time/sec	Level	Value	Time/sec
1	F	0	9	7	16
2	E	2	10	6	18
3	D	4	11	5	20
4	C	6	12	4	22
5	B	8	13	3	24
6	A	10	14	2	26
7	9	12	15	1	28
8	8	14	16	0	30

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3

BIOS Configuration

This chapter describes the different settings available in the Award BIOS that comes with the CI7BM CPU card. The topics covered in this chapter are as follows:

Chapter 6 BIOS and System Setup

This chapter describes the different settings available in the Award BIOS. The topics covered in this chapter are as follows:

BIOS Introduction

The Award BIOS (Basic Input/Output System) installed in your computer system's ROM supports Intel Pentium II processors. The BIOS provides critical low-level support for standard devices such as disk drives, serial ports, and parallel ports. It also adds virus and password protection as well as special support for detailed fine-tuning of the chipset controlling the entire system.

BIOS Setup

The Award BIOS provides a Setup utility program for specifying the system configurations and settings. The BIOS ROM of the system stores the Setup utility. When you turn on the computer, the Award BIOS is immediately activated. Pressing the <Del> key immediately allows you to enter the Setup utility. If you are a little bit late pressing the <Del> key, POST (Power On Self Test) will continue with its test routines, thus preventing you from invoking the Setup. If you still wish to enter Setup, restart the system by pressing the "Reset" button or simultaneously pressing the <Ctrl>, <Alt> and <Delete> keys. You can also restart by turning the system Off and back On again. The following message will appear on the screen:

```
Press  <DEL>  to  Enter  Setup
```

In general, you press the arrow keys to highlight items, <Enter> to select, the <PgUp> and <PgDn> keys to change entries, <F1> for help and <Esc> to quit.

When you enter the Setup utility, the Main Menu screen will appear on the screen. The Main Menu allows you to select from various setup functions and exit choices.

ROM PCI/ISA BIOS
CMOS SETUP UTILITY
AWARD SOFTWARE, INC.

STANDARD CMOS SETUP	CPU SPEED SETTING
BIOS FEATURES SETUP	INTEGRATED PERIPHERALS
CHIPSET FEATURES SETUP	SUPERVISOR PASSWORD
POWER MANAGEMENT SETUP	USER PASSWORD
PNP/PCI CONFIGURATION	IDE HDD AUTO DETECTION
LOAD BIOS DEFAULTS	SAVE & EXIT SETUP
LOAD SETUP DEFAULTS	EXIT WITHOUT SAVING
ESC : Quit	↑ ↓ → ← : Select Item
F10 : Save & Exit Setup	(Shift) F2 : Change Color
Time, Date, Hard Disk Type	

The section below the setup items of the Main Menu displays the control keys for this menu. Another section at the bottom of the Main Menu just below the control keys section displays information on the currently highlighted item in the list.

NOTE: *After making and saving system changes with Setup, you find that your computer cannot boot, the Award BIOS supports an override to the CMOS settings that resets your system to its default.*

We strongly recommend that you avoid making any changes to the chipset defaults. These defaults have been carefully chosen by both Award and your system manufacturer to provide the absolute maximum performance and reliability.

Standard CMOS Setup

"Standard CMOS Setup" choice allows you to record some basic hardware configurations in your computer system and set the system clock and error handling. If the motherboard is already installed in a working system, you will not need to select this option. You will need to run the Standard CMOS option, however, if you change your system hardware configurations, the onboard battery fails, or the configuration stored in the CMOS memory was lost or damaged.

```
                        ROM PCI/ISA BIOS
                       STANDARD CMOS SETUP
                       AWARD SOFTWARE, INC.

  Date (mm:dd:yy) : Wed,  Mar  4 1998
  Time (hh:mm:ss) :     00 : 00 : 00

 HARD DISKS       TYPE   SIZE   CYLS   HEAD   PRECOMP   LANDZ   SECTOR   MODE

 Primary Master   Auto     0      0      0       0        0        0     Auto
 Primary Slave    Auto     0      0      0       0        0        0     Auto
 Secondary Master Auto     0      0      0       0        0        0     Auto
 Secondary Slave  Auto     0      0      0       0        0        0     Auto

 Drive A          : 1.44M, 3.5in           Base Memory     :       640K
 Drive B          : None               Extended Memory     :     15360K
                                           Other Memory     :       384K
 Video            : EGA / VGA
 Halt On          : All Errors             Total Memory     :     16384K

 ESC : Quit                 ↑ ↓ → ← : Select    Item    PU / PD / + / - : Modify
 F1  : Help                 (Shift) F2  : Change Color
```

At the bottom of the menu are the control keys for use on this menu. If you need any help in each item field, you can press the <F1> key. It will display the relevant information to help you. The memory display at the lower right-hand side of the menu is read-only. It will adjust automatically according to the memory changed. The following describes each item of this menu.

Date
The date format is:

Day :	**Sun to Sat**
Month :	**1 to 12**
Date :	**1 to 31**
Year :	**1994 to 2079**

To set the date, highlight the "Date" field and use the PageUp/ PageDown or +/- keys to set the current time.

Time

The time format is: **Hour   : 00 to 23**
                       Minute : 00 to 59
                       Second : 00 to 59

To set the time, highlight the "Time" field and use the <PgUp>/ <PgDn>
or +/- keys to set the current time.

Primary HDDs / Secondary HDDs

The onboard PCI IDE connectors provide Primary and Secondary
channels for connecting up to four IDE hard disks or other IDE devices.
Each channel can support up to two hard disks; the first is the "Master"
and the second is the "Slave".

To enter the specifications for a hard disk drive, you must select first a
"Type". There are 45 predefined types and 4 user definable types are for
Enhanced IDE BIOS. Type 1 to 45 are predefined. Type "User" is
user-definable. For the Primary Master/Slave as well as Secondary
Master/Slave, you can select "Auto" under the TYPE and MODE fields.
This will enable auto detection of your IDE drives and CD-ROM drive
during POST.

Press <PgUp>/<PgDn> to select a numbered hard disk type or type the
number and press the <Enter> key. The hard disk will not work properly
if you enter incorrect information for this field. If your hard disk drive
type is not matched or listed, you can use Type User to define your own
drive type manually. If you select Type User, related information is asked
to be entered to the following items.

CYLS :	Number of cylinders
HEAD :	Number of read/write heads
PRECOMP :	Write precompensation
LANDZ :	Landing zone
SECTOR :	Number of sectors
SIZE :	Automatically adjust according to the configuration
MODE (for IDE HDD only) :	Auto
	Normal (HD < 528MB)
	Large (for MS-DOS only)
	LBA (HD > 528MB and supports
	Logical Block Addressing)

NOTE: *The specifications of your drive must match with the drive table. The hard disk will not work properly if you enter incorrect information in these fields. If your hard disk drive type is not matched or listed, you can use Type User to define your own drive type manually.*

Drive A / Drive B
These fields identify the types of floppy disk drive A or drive B that has been installed in the computer. The available specifications are:

360KB	1.2MB	720KB	1.44MB	2.88MB
5.25 in.	5.25 in.	3.5 in.	3.5 in.	3.5 in.

Video
This field selects the type of video display card installed in your system. You can choose the following video display cards:

EGA/VGA	For EGA, VGA, SEGA, SVGA or PGA monitor adapters. (default)
CGA 40	Power up in 40 column mode.
CGA 80	Power up in 80 column mode.
MONO	For Hercules or MDA adapters.

Halt On
This field determines whether the system will halt if an error is detected during power up.

No errors	The system boot will not be halted for any error that may be detected.
All errors	Whenever the BIOS detects a non-fatal error, the system will stop and you will be prompted.
All, But Keyboard	The system boot will not be halted for a keyboard error; it will stop for all other errors
All, But Diskette	The system boot will not be halted for a disk error; it will stop for all other errors.
All, But Disk/Key	The system boot will not be halted for a keyboard or disk error; it will stop for all others.

BIOS Features Setup

This section allows you to configure and improve your system and allows you to set up some system features according to your preference.

```
                              ROM / PCI ISA BIOS
                             BIOS FEATURES SETUP
                             AWARD SOFTWARE, INC.
```

Virus Warning	: **Disabled**	Video BIOS Shadow	: Enabled
CPU Internal Cache	: Enabled	C8000-CBFFF Shadow	: Disabled
External Cache	: Enabled	CC000-CFFFF Shadow	: Disabled
CPU L2 Cache ECC Checking	: Enabled	D0000-D3FFF Shadow	: Disabled
Quick Power On Self Test	: Enabled	D4000-D7FFF Shadow	: Disabled
Boot Sequence	: A, C, SCSI	D8000-DBFFF Shadow	: Disabled
Swap Floppy Drive	: Disabled	DC000-DFFF Shadow	: Disabled
Boot Up Floppy Drive	: Enabled		
Boot Up Numlock Status	: On		
Gate A20 Option	: Fast		
Typematic Rate Setting	: Disabled		
Typematic Rate (chars/Sec)	: 6		
Typematic Delay (Msec)	: 250		
Security Option	: Setup		
PCI /VGA Palette Snoop	: Disabled		
OS Select For DRAM>64MB	: Non-OS2	ESC : Quit	↑ ↓ → ← : Select Item
Report No FDD For WIN 95	: Yes	F1 : Help	PU/PD/+/- : Modify
		F5 : Old Values	(Shift) F2 : Color
		F6 : Load BIOS Defaults	
		F7 : Load Setup Defaults	

Virus Warning

This item protects the boot sector and partition table of your hard disk against accidental modifications. If an attempt is made, the BIOS will halt the system and display a warning message. If this occurs, you can either allow the operation to continue or run an anti-virus program to locate and remove the problem.

> *NOTE: Many disk diagnostic programs, which attempt to access the boot sector table, can cause the virus warning. If you will run such a program, disable the Virus Warning feature.*

CPU Internal Cache / External Cache

Cache memory is additional memory that is much faster than conventional DRAM (system memory). CPUs from 486-type on up contain internal cache memory, and most, but not all, modern PCs have additional (external) cache memory. When the CPU requests data, the system transfers the requested data from the main DRAM into cache memory, for even faster access by the CPU. These items allow you to enable (speed up memory access) or disable the cache function. By default, these items are ***Enabled***.

CPU L2 Cache ECC Checking
When enabled, this allows ECC checking of the CPU's L2 cache. By default, this field is *Enabled*.

Quick Power On Self Test
When enabled, this field speeds up the Power On Self Test (POST) after the system is turned on. If it is set to *Enabled*, BIOS will skip some items.

Boot Sequence
This field determines the drive that the system searches first for an operating system. The default value is *A, C, SCSI*. The options are :

A, C, SCSI	D, A, SCSI	SCSI, C, A
C, A, SCSI	E, A, SCSI	C only
C, CDROM, A	F, A, SCSI	LS/ZIP, C
CDROM, C, A	SCSI, A, C	

Swap Floppy Drive
This item allows you to determine whether to enable Swap Floppy Drive or not. When enabled, the BIOS swaps floppy drive assignments so that Drive A becomes Drive B, and Drive B becomes Drive A. By default, this field is set to *Disabled.*

Boot Up Floppy Seek
When enabled, the BIOS will seek whether or not the floppy drive installed has 40 or 80 tracks. 360K type has 40 tracks while 760K, 1.2M and 1.44M all have 80 tracks. By default, this field is set to *Enabled.*

Boot Up NumLock Status
This allows you to activate the NumLock function after you power up the system. By default, the system boots up with *NumLock* On.

Boot Up System Speed
This has no function and selects the default system speed *(High).*

Gate A20 Option
This field allows you to select how Gate A20 is worked. Gate A20 is a device used to address memory above 1 MB. The default setting is *Fast.*

Typematic Rate Setting
When disabled, continually holding down a key on your keyboard will generate only one instance. When enabled, you can set the two typematic controls listed next. By default, this field is set to *Disabled.*

Typematic Rate (Chars/Sec)
When the typematic rate is enabled, the system registers repeated keystrokes speeds. You can select speed range from 6 to 30 characters per second. By default, this item is set to *6.*

Typematic Delay (Msec)
When the typematic rate is enabled, this item allows you to set the time interval for displaying the first and second characters. By default, this item is set to *250msec.*

Security Option
This field allows you to limit access to the System and Setup. The default value is *Setup*. When you select *System,* the system prompts for the User Password every time you boot up. When you select *Setup,* the system always boots up and prompts for the Supervisor Password only when the Setup utility is called up.

PCI/VGA Palette Snoop
Some non-standard VGA display cards may not show colors properly. This field allows you to set whether MPEG ISA/VESA VGA Cards can work with PCI/VGA or not. When this field is enabled, a PCI/VGA can work with a MPEG ISA/VESA VGA card. When this field is disabled, a PCI/VGA cannot work with a MPEG ISA/VESA Card.

OS Select for DRAM > 64MB
This option allows the system to access greater than 64MB of DRAM memory when used with OS/2 that depends on certain BIOS calls to access memory. The default setting is *Non-OS/2*.

Report No FDD for WIN 95
This option allows Windows 95 to share with other peripherals IRQ6 that is assigned to a floppy disk drive if the drive is not existing. The default setting is *No*.

Video BIOS Shadow
This item allows you to change the Video BIOS location from ROM to RAM. Video Shadow will increase the video speed.

C8000 - CBFFF Shadow/DC000 - DFFFF Shadow
Shadowing a ROM reduces the memory available between 640KB to 1024KB. These fields determine whether optional ROM will be copied to RAM or not.

Chipset Features Setup

This Setup menu controls the configuration of the chipset.

```
                          ROM PCI/ISA BIOS
                      CHIPSET FEATURES SETUP
                        AWARD  SOFTWARE INC.

 SDRAM RAS-to-CAS Delay     : 3      CPU Warning Temperature      : 66°C/151°F
 SDRAM RAS Precharge Time   : 3      Current System Temp.         :
 SDRAM CAS Latency Timer    : 3      Current CPU Temperature      :
 SDRAM Precharge Control    : Disabled   CPU Fan Speed            :
 DRAM Data Integrity Mode   : Non-ECC    Chassis Fan Speed        :
 System BIOS Cacheable      : Disabled   VCCP (V):   1.98 V    VTT (V)  :    1.50 V

 Video BIOS Cacheable       : Enabled    VCC3 (V) :   3.45 V    + 5 V    :    4.99 V
 Video RAM Cacheable        : Disabled   +12 V   :   12.46 V    -12 V    :  -12.54V
 8 Bit I/O Recovery Time    : 3          -5V      :  - 5.21 V
 16 Bit I/O Recovery Time   : 2          Shutdown Temperature         : 75°C/167°F
 Memory Hole At 15MB-16MB   : Disabled
 Passive Release            : Enabled
 Delayed Transaction        : Disabled


                                       ESC : Quit          ↑ ↓ → ← : Select Item
                                       F1 : Help           PU/PD/+/- : Modify
                                       F5 : Old Values      (Shift) F2 : Color
                                       F6 : Load BIOS Defaults
                                       F7 : Load Setup Defaults
```

SDRAM RAS-to-CAS Delay
When DRAM is refreshed, both rows and columns are addressed separately. This field allows you to determine the timing of transition from Row Address Stove (RAS) to Column Address Strobe (CAS).

SDRAM RAS Precharge Time
The precharge time is the number of cycles it takes for the RAS to accumulate its charge before DRAM refresh. If insufficient time is allowed, refresh may be incomplete and the DRAM may fail to retain data.

SDRAM CAS Latency Time
When synchronous DRAM is installed, the number of clock cycles of CAS latency depends on the DRAM timing. Do not reset this field from the default value specified by the system designer.

Bank DRAM Timing
These fields define the speed of the DRAM memory onboard. The options are *Normal*, *Medium*, *Fast*, *Turbo*, *SDRAM 8ns* and *SDRAM10ns*. By default, these fields are set to **SDRAM 10ns**.

DRAM Clock
The DRAM Clock can be set to Host CLK or the CPU clock itself and to *66MHz*. By default, this field is set to ***Host CLK***.

SDRAM Precharge Control
This field enables of enables the SDRAM Precharge Control.

SDRAM Cycle Length
This field sets the SDRAM cycle length to either 2 or 3. The default setting is *3*.

Memory Hole
In order to improve performance, certain space in memory can be reserved for ISA cards. This field allows you to reserve 15MB to 16MB memory address space to ISA expansion cards. This makes memory from 15MB and up unavailable to the system. Expansion cards can only access memory up to 16MB. By default, this field is set to ***Disabled.***

Read Around Write
DRAM optimization feature: If a memory read is addressed to a location whose latest write is being held in a buffer before being written to memory, the read is satisfied through the buffer contents, and the read is not sent to the DRAM. The default setting is ***Enabled***.

Concurrent PCI/Host
This field enables or disables the concurrent PCI/Host. The default setting is ***Disabled***.

Video RAM Cacheable
Selecting ***Enabled*** allows caching of the video BIOS ROM at C0000h to C7FFFh, resulting in better video performance. However, if any program writes to this memory area, a memory access error may result.

DRAM Data Integrity Mode
Set this field to *ECC* if the DRAM installed in the system supports it. Otherwise, do not reset the default of ***Non-ECC***.

System BIOS Cacheable
When enabled, access to the system BIOS ROM addressed at F0000H-FFFFFH is cached, provided that the cache controller is disabled.

Video BIOS Cacheable
When enabled, access to video BIOS addressed at C0000H to C7FFFH is cached, provided that the cache controller is disabled.

Video RAM Cacheable
Selecting *Enabled* allows caching of the video BIOS ROM at C0000h to C7FFFh, resulting in better video performance. However, if any program writes to this memory area, a memory access error may result.

8 Bit I/O Recovery Time
This option specifies the length of the delay (in sysclks) inserted between consecutive 8-bit I/O operations. The settings are 1, 2, 3, 4, 5, 6, 7, or 8. The default setting is *3*.

16 Bit I/O Recovery Time
This option specifies the length of the delay (in sysclks) inserted between consecutive 16-bit I/O operations. The settings are 1, 2, 3, 4, 5, 6, 7, or 8. The default setting is *2*.

Memory Hole at 15MB - 16MB
In order to improve performance, certain space in memory can be reserved for ISA cards. This field allows you to reserve 15MB to 16MB memory address space to ISA expansion cards. This makes memory from 15MB and up unavailable to the system. Expansion cards can only access memory up to 16MB. By default, this field is set to ***Disabled***.

Passive Release
When enabled, CPU to PCI bus accesses are allowed during passive release. Otherwise, the arbiter only accepts another PCI master access to local DRAM.

Delayed 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. The default setting is ***Enabled***.

CPU Warning Temperature
This field sets the threshold temperature at which an alert is sounded through the system's speaker. The CPU temperature is monitored by the onboard thermal sensor to prevent the CPU from overheating.

Current System/CPU Temperature
These read-only fields reflect the functions of the hardware thermal
sensor that monitors the CPU and system temperatures to ensure the
system is stable.

Current CPU Fan Speed/Chassis Fan Speed
These read-only fields show the current speeds in RPM (revolution per
minute) for the CPU fan and chassis fan as monitored by the hardware
monitoring IC.

VCCP / VTT / VCC3
These read-only fields show the current voltages in the voltage regulators
and power supply as monitored by the hardware monitoring IC.

Shutdown Temperature
This field allows you to set the temperature at which the system
automatically shuts down once it is reached, in order to avoid damage to
system components.

Power Management Setup

The Power Management Setup allows you to save energy of your system effectively. It will shut down the hard disk and turn off video display after a period of inactivity.

```
                        ROM PCI/ISA BIOS
                    POWER MANAGEMENT SETUP
                      AWARD  SOFTWARE,  INC.
┌─────────────────────────────────────────────────────────────────────────┐
│ ACPI Function          : Enabled      **  Reload Global Timer Events  **  │
│ Power Management        : User Define  IRQ3 (3-7, 9-15), NMI  : Disabled  │
│ PM Control by APM       : Yes         Primary IDE 0          : Enabled    │
│ Video Off Method        : V/H SYNC +Blank  Primary IDE 1     : Enabled    │
│ Video Off After         : Standby     Secondary IDE 0        : Disabled   │
│ Modem Use IRQ           : 3           Secondary IDE 1        : Disabled   │
│ Doze Mode               : Disabled    Floppy Disk            : Disabled   │
│ Standby Mode            : Disabled    Serial Port            : Enabled    │
│ Suspend Mode            : Disabled    Parallel Port          : Disabled   │
│ HDD Power Down          : Disabled                                        │
│ Throttle Duty Cycle     : 62.5%                                           │
│ PCI/VGA Active Monitor  : Disabled                                        │
│ Soft-Off by PWR-BTTN    : Instant-Off                                     │
│ PowerOn by Ring         : Disabled                                        │
│ Resume by Alarm         : Disabled                                        │
│                                     ─────────────────────────────────    │
│                                     ESC : Quit      ↑ ↓ → ← : Select Item │
│ IRQ 8 Break Suspend     : Disabled  F1 : Help       PU/PD/+/- : Modify    │
│                                     F5 : Old Values  (Shift) F2 : Color   │
│                                     F6 : Load BIOS Defaults               │
│                                     F7 : Load Setup Defaults              │
└─────────────────────────────────────────────────────────────────────────┘
```

ACPI function
ACPI stands for Advanced Configuration Power Interface. The default setting of this field *Enabled*.

Power Management
This field allows you to select the type of power saving management modes. There are fours selections for Power Management.

Min. Power Saving	Minimum power management
Max. Power Saving	Maximum power management.
User Define	Each of the ranges is from 1 min. to 1hr. Except for HDD Power Down which ranges from 1 min. to 15 min. (Default)

NOTE: *In order to enable the CPU overheat protection feature, the Power Management field should not be set to Disabled.*

PM Control by APM
This field allows you to use the Advanced Power Management device to enhance the Max. Power Saving mode and stop the CPU's internal clock. If the Max. Power Saving is not enabled, this will be preset to NO.

Video Off Method
This field defines the Video Off features. There are three options.
V/H SYNC + Blank   Default setting, blank the screen and turn off vertical and horizontal scanning.
DPMS   Allows the BIOS to control the video display card if it supports the DPMS feature.
Blank Screen   This option only writes blanks to the video buffer.

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

Video Off Option
This field determines the state at which video enters into when turned off. By default, this field is set to *Suspend -> Off*.

Modem Use IRQ
This field names the interrupt request (IRQ) line assigned to the modem (if any) on your system. Activity of the selected IRQ always awakens the system. By default, the IRQ is set to *3*.

Doze Mode
When enabled, and after the set time of system inactivity, the CPU clock will run at a slower speed while all other devices still operate at full speed.

Standby Mode
After the selected period of system inactivity, the fixed disk drive and the video shut off while all other devices still operate at full speed.

Suspend Mode
When enabled, and after the set time of system inactivity, all devices except the CPU will be shut off.

HDD Power Down
When enabled, and after the set time of system inactivity, the hard disk drive will be powered down while all other devices remain active.

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

PCI/VGA Act-Monitor
When enabled, any video activity restarts the global timer for Standby mode. The default setting is ***Disabled***.

Soft-Off by PWR-BTTN
This field defines the power-off mode when using an ATX power supply. The Instant-Off mode allows powering off immediately upon 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. The default value is ***Instant-Off***.

Resume by Alarm
This allows a computer to be turned on automatically through the timer set in the BIOS to make the system more scheduleable. By default, this field is set to ***Disabled***.

IRQ 8 Break Suspend
You can enable or disable the monitoring of IRQ 8 (Real Time Clock) so it does not awaken the system from Suspend mode.

Reload Global Timer Events
This section determines the reloading of the 'timers' after entering the Full On You can enable or disable the monitoring of IRQ 8 (Real Time Clock) so it does not awaken the system from Suspend mode.

PM Events
The VGA, LPT & COM, HDD & FDD, DMA /master, PWR-On by Modem/LAN, RTC Alarm Resume and Primary INTR section are I/O events which can prevent the system from entering a power saving mode or can awaken the system from such a mode. When an I/O device wants to gain the attention of the operating system, it signals this by causing an IRQ to occur. When the operating system is ready to respond to the request, it interrupts itself and performs the service. The default value is *Off*. When set On, activity will neither prevent the system from going into a power management mode nor awaken it. The IRQ section sets the wake-up call of the system. If activity is detected from any enabled IRQ channels in the left-hand group, the system wakes up from suspended mode.

PNP/PCI Configuration

This option configures the PCI bus system. All PCI bus systems on the system use INT#, thus all installed PCI cards must be set to this value.

```
                        ROM PCI/ISA BIOS
                     PNP/PCI CONFIGURATION
                      AWARD SOFTWARE INC.
```

PNP OS Installed	: No	Used MEM base addr : N/A
Resources Controlled by	: Manual	
Reset Configuration Data	: Disabled	
IRQ-3 assigned to	: Legacy ISA	
IRQ-4 assigned to	: Legacy ISA	
IRQ-5 assigned to	: PCI/ISA PnP	
IRQ-7 assigned to	: Legacy ISA	
IRQ-9 assigned to	: PCI/ISA PnP	
IRQ-10 assigned to	: PCI/ISA PnP	
IRQ-11 assigned to	: PCI/ISA PnP	
IRQ-12 assigned to	: PCI/ISA PnP	
IRQ-14 assigned to	: PCI/ISA PnP	
IRQ-15 assigned to	: PCI/ISA PnP	
DMA-0 assigned to	: PCI/ISA PnP	
DMA-1 assigned to	: PCI/ISA PnP	ESC : Quit ↑ ↓ ← : Select Item
DMA-3 assigned to	: PCI/ISA PnP	F1 : Help PU/PD/+/- : Modify
DMA-5 assigned to	: PCI/ISA PnP	F5 : Old Values (Shift) F2 : Color
DMA-6 assigned to	: PCI/ISA PnP	F6 : Load BIOS Defaults
DMA-7 assigned to	: PCI/ISA PnP	F7 : Load Setup Defaults

PNP OS Installed

This field allows you to specify if the operating system installed in your system is plug and play aware.

NOTE: *Operating systems such as DOS, OS/2, and Windows 3.x do not use PnP*

Resources Controlled by

This PnP BIOS can configure all of the boot and compatible devices automatically. However, this capability needs you to use a PnP operating system such as Windows 95. The default value is ***Manual***.

Reset Configuration Data

This field allows you to determine whether to reset the configuration data or not. The default value is ***Disabled***.

IRQ3/4/5/7/9/10/11/12/14/15, DMA0/1/3/5/6/7 assigned to

These fields allow you to determine the IRQ/DMA assigned to the ISA bus and is not available to any PCI slot.

Used MEM base addr

Select a base address for the memory area used by any peripheral that requires high memory. The default setting is ***N/A***.

Load BIOS Defaults

This option allows you to load the troubleshooting default values permanently stored in the BIOS ROM. These default settings are non-optimal and disable all high-performance features.

ROM PCI/ISA BIOS
CMOS SETUP UTILITY
AWARD SOFTWARE, INC.

STANDARD CMOS SETUP	CPU SPEED SETTING
BIOS FEATURES SETUP	INTEGRATED PERIPHERALS
CHIPSET FEATURES SETUP	SUPERVISOR PASSWORD
POWER MANAG	D
PNP/PCI CONFI Load BIOS Defaults (Y/N)? N ETECTION	
LOAD BIOS DEF	UP
LOAD SETUP DEFAULTS	EXIT WITHOUT SAVING
ESC : Quit	↑ ↓ → ← : Select Item
F10 : Save & Exit Setup	(Shift) F2 : Change Color
Load BIOS Defaults except Standard CMOS Setup	

To load BIOS defaults value to CMOS SRAM, enter "Y". If not, enter "N".

Load Setup Defaults

This option allows you to load the default values to your system configuration. These default settings are optimal and enable all high performance features.

ROM PCI/ISA BIOS
CMOS SETUP UTILITY
AWARD SOFTWARE, INC.

STANDARD CMOS SETUP	CPU SPEED SETTING
BIOS FEATURES SETUP	INTEGRATED PERIPHERALS
CHIPSET FEATURES SETUP	SUPERVISOR PASSWORD
POWER MANAG	D
PNP/PCI CONFI Load Setup Defaults (Y/N)? N ETECTION	
LOAD BIOS DEF	UP
LOAD SETUP DEFAULTS	EXIT WITHOUT SAVING
ESC : Quit	↑ ↓ → ← : Select Item
F10 : Save & Exit Setup	(Shift) F2 : Change Color
Load BIOS Defaults except Standard CMOS Setup	

To load SETUP defaults value to CMOS SRAM, enter "Y". If not, enter "N".

Integrated Peripherals

This option sets your hard disk configuration, mode and port.

```
                              ROM PCI/ISA BIOS
                          INTEGRATED PERIPHERALSP
                            AWARD  SOFTWARE INC.

 IDE HDD Block Mode          : Enabled
 IDE Primary Master PIO      : Auto       Onboard Parallel Port       : 378/IRQ7
 IDE Primary Slave PIO       : Auto       Parallel Port Mode          : SPP
 IDE Secondary Master PIO    : Auto
 IDE Secondary Slave PIO     : Auto
 IDE Primary Master UDMA     : Auto
 IDE Primary Slave UDMA      : Auto
 IDE Secondary Master UDMA   : Auto
 IDE Secondary Slave UDMA    : Auto
 On-Chip Primary PCI IDE     : Enabled
 On-Chip Secondary PCI IDE   : Enabled
 Onboard PCI SCSI Chip       : Enabled
 USB Keyboard Support        : Disabled
 Init AGP Display First      : AGP

 Onboard FDC Controller      : Enabled    ESC : Quit          ↑ ↓ ← : Select Item
 Onboard Serial Port 1       : 3F8/IRQ4   F1 : Help           PU/PD/+/- : Modify
 Onboard Serial Port 2       : 2F8/IRQ3   F5 : Old Values     (Shift) F2 : Color
 UART Mode Select            : Normal     F6 : Load BIOS Defaults
                                          F7 : Load Setup Defaults
```

IDE HDD Block Mode
This field allows your hard disk controller to use the fast block mode to transfer data to and from your hard disk drive.

IDE Primary/Secondary Master/Slave PIO
These fields allow your system hard disk controller to work faster. Rather than have the BIOS issue a series of commands that transfer to or from the disk drive, PIO (Programmed Input/Output) allows the BIOS to communicate with the controller and CPU directly.

The system supports five modes, numbered from 0 (default) to 4, which primarily differ in timing. When Auto is selected, the BIOS will select the best available mode.

IDE Primary/Secondary Master/Slave UDMA
These fields allow your system to improve disk I/O throughput to 33Mb/sec with the Ultra DMA/33 feature. The options are *Auto* and *Disabled*.

On-Chip Primary/Secondary PCI IDE
The integrated peripheral controller contains an IDE interface with support for two IDE channels. Select *Enabled* to activate each channel separately.

Onboard PCI SCSI Chip
The default setting of ***Enabled*** enables the onboard PCI SCSI function of the system

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

Init AGP Display First
This field allows the system to initialize first the VGA card in the AGP slot when system is turned on.

Onboard FDC Controller
Select *Enabled* if your system has a floppy disk controller (FDC) installed on the system and you wish to use it. If you install an add-in FDC or the system has no floppy drive, select Disabled in this field. This option allows you to select the onboard FDD port.

Onboard Serial/Parallel Port
These fields allow you to select the onboard serial and parallel ports and their addresses. The default values for these ports are:

Serial Port 1	3F8/IRQ4
Serial Port 2	2F8/IRQ3
Parallel Port	378H/IRQ7

UART Mode Select
This field determines the UART mode in your computer. The settings are *Normal, IrDA and ASKIR*. The default value is ***Normal***.
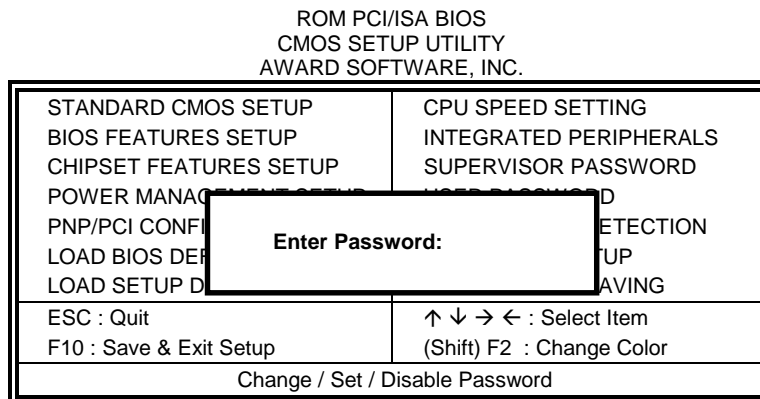
Parallel Port Mode
This field allows you to determine parallel port mode function.

SPP	Normal Printer Port
EPP	Enhanced Parallel Port
ECP	Extended Capabilities Port

Supervisor / User Password

These two options set the system password. Supervisor Password sets a password that will be used to protect the system and Setup utility. User Password sets a password that will be used exclusively on the system. To specify a password, highlight the type you want and press <Enter>. The Enter Password: message prompts on the screen. Type the password, up to eight characters in length, and press <Enter>. The system confirms your password by asking you to type it again. After setting a password, the screen automatically returns to the main screen.

To disable a password, just press the <Enter> key when you are prompted to enter the password. A message will confirm the password to be disabled. Once the password is disabled, the system will boot and you can enter Setup freely.

```
                        ROM PCI/ISA BIOS
                       CMOS SETUP UTILITY
                      AWARD SOFTWARE, INC.
```

STANDARD CMOS SETUP	CPU SPEED SETTING
BIOS FEATURES SETUP	INTEGRATED PERIPHERALS
CHIPSET FEATURES SETUP	SUPERVISOR PASSWORD
POWER MANAGEMENT SETUP	USER PASSWORD
PNP/PCI CONFI~~~~ **Enter Password:** ~~~~ETECTION	
LOAD BIOS DEF~~~~~~~~~~~~~~~~~~~~~~~~~~~~UP	
LOAD SETUP D~~~~~~~~~~~~~~~~~~~~~~~~~~~~AVING	
ESC : Quit	↑ ↓ → ← : Select Item
F10 : Save & Exit Setup	(Shift) F2 : Change Color
Change / Set / Disable Password	

IDE HDD Auto Detection

This option detects the parameters of an IDE hard disk drive, and automatically enters them into the Standard CMOS Setup screen.

ROM PCI/ISA BIOS
STANDARD CMOS SETUP
AWARD SOFTWARE, INC.

HARD DISKS	TYPE	SIZE	CYLS	HEAD	PRECOMP	LANDZ	SECTOR	MODE
Primary Master:								

Select Primary Master Option (N=SKIP) : N

OPTIONS	TYPE	SIZE	CYLS	HEAD	PRECOMP	LANDZ	SECTOR	MODE
1 (Y)	0	0	0	0	0	0	0	NORMAL

NOTE: Some OSes (like SCO-UNIX) must use "NORMAL" for installation

ESC: SKIP

Up to four IDE drives can be detected, with parameters for each appearing in sequence inside a box. To accept the displayed entries, press the "Y" key to skip to the next drive, press the "N" key. If you accept the values, the parameters will appear listed beside the drive letter on the screen.

Save & Exit Setup

This option allows you to determine whether to accept the modifications or not. If you type "Y", you will quit the setup utility and save all changes into the CMOS memory. If you type "N", you will return to Setup utility.

ROM PCI/ISA BIOS
CMOS SETUP UTILITY
AWARD SOFTWARE, INC.

STANDARD CMOS SETUP	CPU SPEED SETTING
BIOS FEATURES SETUP	INTEGRATED PERIPHERALS
CHIPSET FEATURES SETUP	SUPERVISOR PASSWORD
POWER MANAG	D
PNP/PCI CONFI **Save to CMOS and Exit (Y/N)? N** ETECTION	
LOAD BIOS DEF	UP
LOAD SETUP DEFAULTS	EXIT WITHOUT SAVING
ESC : Quit	↑ ↓ → ← : Select Item
F10 : Save & Exit Setup	(Shift) F2 : Change Color
Save Data to CMOS & Exit Setup	

Exit Without Saving

Select this option to exit the Setup utility without saving the changes you have made in this session. Typing "Y" will quit the Setup utility without saving the modifications. Typing "N" will return you to Setup utility.

ROM PCI/ISA BIOS
CMOS SETUP UTILITY
AWARD SOFTWARE, INC.

STANDARD CMOS SETUP	CPU SPEED SETTING
BIOS FEATURES SETUP	INTEGRATED PERIPHERALS
CHIPSET FEATURES SETUP	SUPERVISOR PASSWORD
POWER MANAG	D
PNP/PCI CONFI **Quit Without Saving (Y/N)? N** ETECTION	
LOAD BIOS DEF	UP
LOAD SETUP DEFAULTS	EXIT WITHOUT SAVING
ESC : Quit	↑ ↓ → ← : Select Item
F10 : Save & Exit Setup	(Shift) F2 : Change Color
Abandon all Data & Exit Setup	

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4

Intel PIIX Bus Master IDE Driver Installation

This chapter describes the installation procedure for Intel PIIX Bus Master IDE Drivers for Windows 95.

This chapter contains the following sections:

System Requirements

This section describes system requirements for the PIIX Bus Master IDE Device Driver for Windows 95*. This driver has been designed for and tested with Windows 95 only. This driver will only install on systems with Windows 95.

1.   The system must contain a supported Intel processor and chipset configuration.

2.   Ensure that a mouse is connected to the system.

3.   One of the following versions of Windows 95* must be installed on the system prior to running utility program.

   Windows 95* 4.00.950   (Retail)
   Windows 95* 4.00.950a (OSR1)
   Windows 95* 4.00.950b (OSR2 without USB Supplement)
   Windows 95* 4.00.950b (OSR2.1 with USB Supplement)

4.   This utility should only be used on desktop systems. The utility must not be executed on notebook or portable systems with or without dock.

5.   It is assumed that the BIOS properly initialized the 82371xB IDE interface for Bus Master IDE operation.

6.   There is no other non-82371xB IDE controllers (add-in IDE controller or sound card with IDE) enabled on the system.

Installing the Software

This subsection describes how to install the software on a system where Windows 95 is installed.

> **NOTE**: Record the location of the Windows 95* directory before installing the driver.

1. Check the System Requirements. Windows 95* must be fully installed and running on the system prior to running this software.

2. Close any running applications.

3. Remove references to installed real-mode IDE device drivers in the AUTOEXEC.BAT and CONFIG.SYS files (especially any drivers that control ATAPI CD-ROM and special IDE features). Use the Notepad utility to do this.

The driver files are stored in an integrated application setup program. This program is a Windows 95* program that allows the driver files to be INSTALLED or DE-INSTALLED.

Execute the driver setup program.

Run **SETUP.EXE**.

4. Click 'Next' on Welcome Screen to read and agree to the license agreement. View the text file and choose File\Exit to close Notepad and continue. NOTE: If you click **No**, program will terminate.

5. Click **Yes** if you agree to continue. NOTE: If you click 'No', the program will terminate.

6. Select **INSTALL**, to install the PIIX Bus Master IDE Device Driver when prompted to do so.

NOTE: If the driver is currently installed on the system, SETUP will ask you whether or not you want to continue. Follow the prompts on the screen to install the driver if desired.

7. Click 'OK' to restart the system when prompted to do so.

8. Follow the screen instructions and use default settings to complete the setup when Windows 95* is re-started. Upon re-start, Windows 95* will display that it has found an Intel PCI Bus Master IDE controller hardware and is installing hardware for it.

If a **New Hardware Found** dialog box is displayed requesting the location of the drivers, use the mouse to click on the scrollbar and click on the <Windows 95* directory>\System\IOSubSys path:
   For example:
   Click on **C:\WINDOWS\SYSTEM\IOSUBSYS**
   Click **OK**.

9.   Select **Yes**, when prompted to re-start Windows 95.

   NOTE: After installation, the following driver and related files are stored as listed.

   <Windows 95* directory>\System\IOSubSys\IDEATAPI.MPD
   <Windows 95* directory>\System\IOSubSys\PIIXVSD.VXD
   <Windows 95* directory>\INF\IDEATAPI.INF

5

VGA Driver Installation

This chapter provides information on how to install the C&T 69000 VGA drivers that come in the two floppy diskettes with the package. Please follow the instructions set forth in this chapter carefully. Please note that there must be relevant software installed in your system before you could proceed to install the VGA drivers. It is recommended that you make a copy of the VGA driver diskette and put the backup copy in a safe place.

The following items are covered in this chapter:

Installing the Drivers for Windows 95

The following section describes the normal display driver installation procedures for Windows 95. Use the following procedures when installing the display drivers for Windows 95.

1. Click **Start**. Select **Settings**, then click the **Control Panel** icon.
2. Double click **Display**.
3. Click **Settings**.
4. Click **Advanced Properties**.
5. Click **Change**.
6. Click **Have Disk ....**
7. Insert the diskette/CD containing the **69000 VGA driver for Windows 95** to the floppy disk drive/CD-ROM drive, then type in **A:\WIN95** (assuming drive A is your floppy disk drive) or type in **D:\VGA\C&T\WIN95** (assuming drive D is your CD-ROM drive), and press **Enter**.
8. Select **Chips and Tech. 69000 PCI/AGP**, and then click **OK**. After the files are copied, click **Close**.
9. Click **Yes** to restart your computer and for the new settings to take effect.

Installing the Drivers for Windows 98

The following section describes the normal display driver installation procedures for Windows 98. Use the following procedures when installing the display drivers for Windows 98.

1. Click **Start**. Select **Settings**, and then click the **Control Panel** icon.
2. Double click **Display**.
3. Click **Settings**.
4. Click **Advanced...**.
5. Click **Adapter**.
6. Click **Change....**
7. Click **Next**.
8. Select **Display a list of all the drivers in a specific location, so you can select the driver you want.**
9. Click "**Have Disk ...**".
10. Insert the diskette/CD containing the **C&T 69000 VGA driver for Windows 98** to the floppy disk drive/CD-ROM drive, then type in **A:\WIN98** (assuming drive A is your floppy disk drive) or type in **D:\VGA\C&T\WIN98** (assuming drive D is your CD-ROM drive), and press **Enter**.
11. Select **Chips and Tech. 69000 PCI/AGP**", and click **OK**.
12. Click **Next**. After the files are copied, and click **Finish**.
13. Click **Close**.
14. Click **Close**.
15. Click **Yes** to restart your computer and for the new settings to take effect.

Installing the Drivers for Windows NT 4.0

IMPORTANT: You should install the Windows NT 4.0 Service Pack 3 first before installing the C&T 69000 VGA drivers. If you don't have the Windows NT 4.0 Service Pack 3, please contact your software vendor or download it from Microsoft's web site.

The procedures below show you how to install the C&T 69000 VGA drivers for Windows NT 4.0.

1. Boot Windows NT 4.0.
2. Double click the **My Computer** icon.
3. Double click the **Control Panel** icon.
4. Double click the **Display" icon**.
5. Click **Change Display Type**.
6. Click **Change**.
7. Click **Have Disk**, then insert the diskette/CD containing the **C&T 69000 VGA driver for Windows NT 4.0** to the floppy disk drive/CD-ROM drive, then type in **A:\WINNT40** (assuming drive A is your floppy disk drive) or type in **D:\VGA\C&T\WINNT40** (assuming drive D is your CD-ROM drive), and press **Enter**.
8. Select **Chips Video Accelerator (65545/48/50/54/55 68554 69000)**, and then click **OK**.
9. Click **Yes** to copy the drivers from the floppy disk/CD to the hard disk.
10. When copying is done, click **OK**.
11. Click **Close**.
12. Click **OK**.
13. Windows NT 4.0 will prompt you to restart computer. Click **OK** to change the Windows NT configuration.

6

Audio Driver Installation

This chapter provides information on how to install the audio drivers for Creative Labs ViBRA 16VX that come in floppy diskettes with your package. Please follow the instructions set forth in this chapter. It is recommended that you make a copy of the audio driver diskette and put the backup copy in a safe place.

The following items are covered in this chapter:

Installing The Audio Driver For Windows 95

Step 1. Turn on the computer and start Windows 95.

Step 2. Insert the diskette labeled " **Windows 95 Audio Applications Diskette 1/3**."

Step 3. Click on **START => RUN** and type **A:\SETUP** to install the audio software and drivers. The welcome screen is then displayed as shown below.

Step 4. Click the **Next** button to continue the installation process and carefully follow the installation wizard.

Step 5. When the setup wizard prompts you for the setup method, it is recommended to choose **FULL INSTALLATION**. Select this option and click **Next**.

Step 6. Upon completion of the software and driver installation, the system will prompt you to restart the system. Restart the system to activate the drivers.

Installing The Audio Driver For Windows 98

1. The Windows 98 operating system CD comes with the drivers for ViBRA 16VX. Install the Windows 98 default drivers and restart your computer for the changes to take effect.

2. To update the drivers, insert the diskette labeled **Windows 95/98 Update Drivers**. Click on **START => RUN** and type **A:\upddrv95.exe**. After the files are copied, restart the computer for the changes to take effect.

7

LAN Driver Installation Guide

This chapter describes LAN features and driver installation of the onboard Intel 82558B Ethernet controller.

The following items are covered in this chapter:

Introduction

Intel 82558B is a 32-bit 10/100MBps Ethernet controller for PCI local bus-compliant PCs. It supports the bus mastering architecture, and Auto-negotiation feature which make it possible to combine one common type of Ethernet cabling − an RJ-45 connector for twisted-pair cabling that can be used for both 10Mbps and 100Mbps connection. Extensive driver support for commonly used network operating systems is also provided.

Features

- Conforms to the Ethernet IEEE 802.3u standard
- Compatible with PCI Local Bus Revision 2.1 specification
- IEEE 802.3u Auto-Negotiation for automatic speed selection
- Supports Full-Duplex/Half-Duplex Operation
- Provides 32-bit bus mastering data transfer
- Supports 10Mbps and 100Mbps operation in a single port
- Supports remote wake-up (Magic Packet*) in APM and ACPI mode

* Requires ATX power supply with 5VSB, 720mA

Software Drivers Support

NetWare ODI Drivers
Novell NetWare 3.x, 4.x, NetWare LAN WorkPlace TCP/IP, Novell LAN Analyzer for NetWare

Packet Drivers
FTP PC/TCP, NCSA TCP/IP

NDIS Drivers
Microsoft LAN Manager V2.x, Windows 3.x, Windows NT 4.0, Windows NT 3.51, Windows 98, Windows 95, SCO3, SCO5; IBM LAN Server 4.0 for DOS and OS/2, and Linux.

Running Diagnostics

The CI7BM comes with two diskettes containing drivers and diagnostic
software supporting the Intel 82558B Ethernet controller. Follow the
steps below to use the *Setup Utility*.

1. Run the file SETUP.EXE typing a:\setup in the DOS prompt,
    assuming your floppy disk drive is drive A. Upon doing so, the
    system starts the *Setup Utility* and shows the following screen.

```
┌──────────────────────────────────────────────────────────┐
│     8255x-based PCI EtherExpress™ adapter Setup V4.16      │
└──────────────────────────────────────────────────────────┘

                   ═══════ Main Menu ═══════
                   Automatic setup
                   View adapter configuration
                   Test adapter
                   Install network drivers
                   View Help files
                   Exit Setup
```

Choose AUTOMATIC SETUP to view the adapter's configuration, make sure it
works properly, and install the software needed to connect to your network.

Help = F1   Exit = Esc   Select = ↑↓   Action = ↵

2. Selecting **View adapter configuration** will show the following.

```
┌──────────────────────────────────────────────────────────┐
│     8255x-based PCI EtherExpress™ adapter Setup V4.16      │
└──────────────────────────────────────────────────────────┘

        ═══════ View adapter configuration ═══════
        Adapter type:…………………..
        Adapter part number:………….
        Network address:………………
        Interrupt:………………………..
        Bus:……………………………..
        Slot:…………………………...
        Device:…………………………..
        Network speed:………………..
        Physical layer device:…………
        Duplex:…………………………..
        Adapter capabilities:
            100BaseTX, full or half duplex.
             10BaseT, full or half duplex.

                 Press Enter to continue
```

Help = F1   Previous = Esc   Continue = Enter   PCI Advanced = F5

3.   Selecting **Test adapter** will show the following screen.

```
┌────────────────────────────────────────────────────────────────┐
│  8255x-based PCI EtherExpress™ adapter Setup V4.16               │
└────────────────────────────────────────────────────────────────┘

                        ─── Test adapter ───

   ┌──────────────────────────────────────────────────────┐
   │  Bus=0  Dev=0Bh  Slot=11  Addr=004063001000  IRQ=10   │
   │  Diagnostic tests:                                     │
   │                                                        │
   │     Adapter tests ……………………………         Passed         │
   │     Onboard loopback tests ………………..    passed         │
   │     Network test ……………………………           passed         │
   │     10Mbps                                             │
   │                                                        │
   │     This adapter works properly                        │
   │                                                        │
   │           Press Enter to continue                      │
   │                                                        │
   └──────────────────────────────────────────────────────┘
```

Help = F1   Press Enter to continue

4.   Selecting **Install network drivers** will show the following screen.

```
┌────────────────────────────────────────────────────────────────┐
│  8255x-based PCI EtherExpress™ adapter Setup V4.16               │
└────────────────────────────────────────────────────────────────┘
                          Main Menu
              ┌─── Install network drivers ───┐
              │        Novel                  │
              │        Microsoft              │
              │        Other                  │
              │                               │
              │  Exit Setup                   │
              └───────────────────────────────┘
```

Choose OTHER if you use a network operating system from a manufacturer not
on this list (such as Banyan or UNIX).

Help = F1   Press Enter to continue

5.   Upon selecting **Others** under the **Install network drivers main menu** screen, the following screen will appear.

```
┌─────────────────────────────────────────────────────────┐
│    8255x-based PCI EtherExpress™ adapter Setup V4.16      │
└─────────────────────────────────────────────────────────┘

              ═══════════════ Other ═══════════════
           ┌──────────────────────────────────────────────┐
           │  1. LANtastic 6.0                            │
           │  2. Banyan 6.00 NDIS workstation            │
           │  3. NDIS 2.x driver notes (OS/2*, LAN Manager* others) │
           │  4. Using IBM LAN support for AS/400 and NetWare │
           │  5. LAN Server                              │
           │  6. UNIX driver information                  │
           └──────────────────────────────────────────────┘
```

Choose OTHER if you use a network operating system from a manufacturer not on this list (such as Banyan or UNIX).

Help = F1   Previous = Esc   Select = ↑↓   Accept = ↵

6.   Selecting **View Help files** under the **Main menu** will show the following screen.

```
┌─────────────────────────────────────────────────────────┐
│    8255x-based PCI EtherExpress™ adapter Setup V4.16      │
└─────────────────────────────────────────────────────────┘
                        Main Menu
              ═══════════ View Help files ═══════════
           ┌──────────────────────────────────────────────┐
           │  Installing EtherExpress™ PRO/100+ adapter drivers │
           │  Latest News and general adapter information │
           │  Hardware specifications and cabling information │
           │  Adapter installation and special configurations │
           │  Running diagnostics and error messages     │
           └──────────────────────────────────────────────┘
```

Help = F1   Previous = Esc   Select = ↑↓   Display Choices = ↵

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8

System Monitor Utility

This chapter introduces System Monitor Utility that comes with the CPU card in conjunction with the onboard hardware monitoring IC. The sections in the following pages describe the functions of the utility.

System Monitor is utility software that oversees the general performance of systems, covering areas like system temperature, system voltage, CPU and system fan rotational speeds. If conditions become adverse, that is, when voltages are erratic or CPU temperature exceeds the safe limits, an alarm will be sounded; thereby preventing system crashing and ensuring overall stability.

NOTE: System Monitor currently supports English and Chinese under Windows 95 and Windows NT. English will be used for other language environments.

When System Monitor is initiated, the icon below appears in the task bar in the Windows environment.

The following screen appears upon clicking on the System Monitor icon.
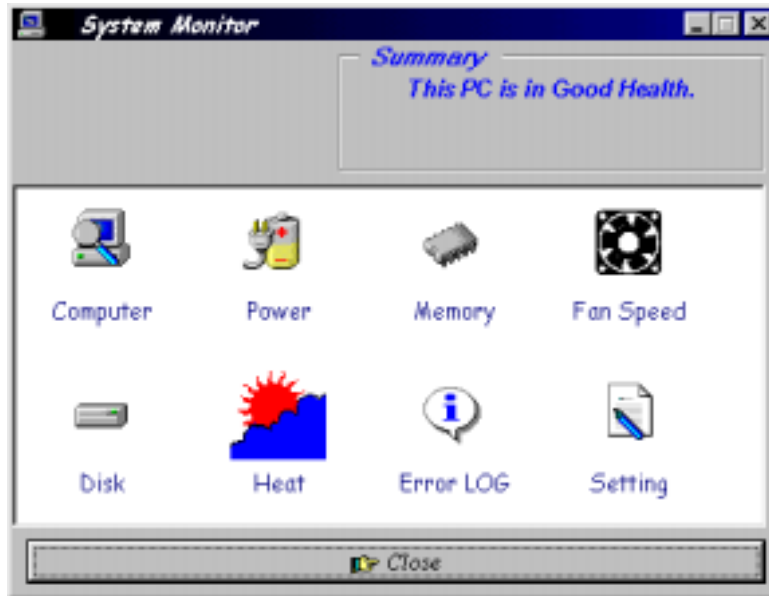
Clicking on the upper left corner button would show you the latest company information. "Summary" provides the current system status.

The section below describes the different functions of System Monitor.

1. Computer - displays the current working system version and processor type.
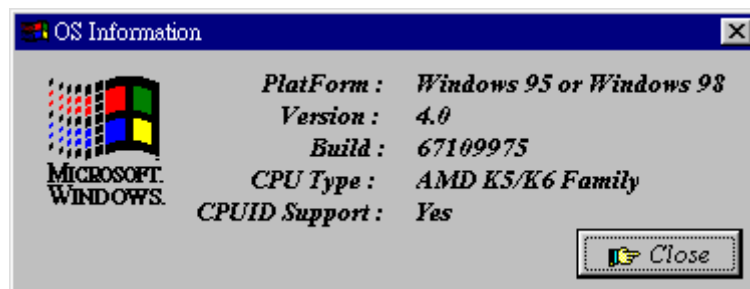
2.   Power - displays the current voltage status.
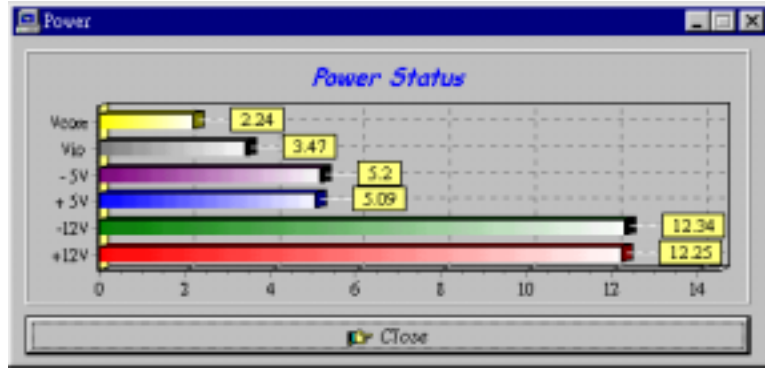
3. Memory - displays the current memory usage status.
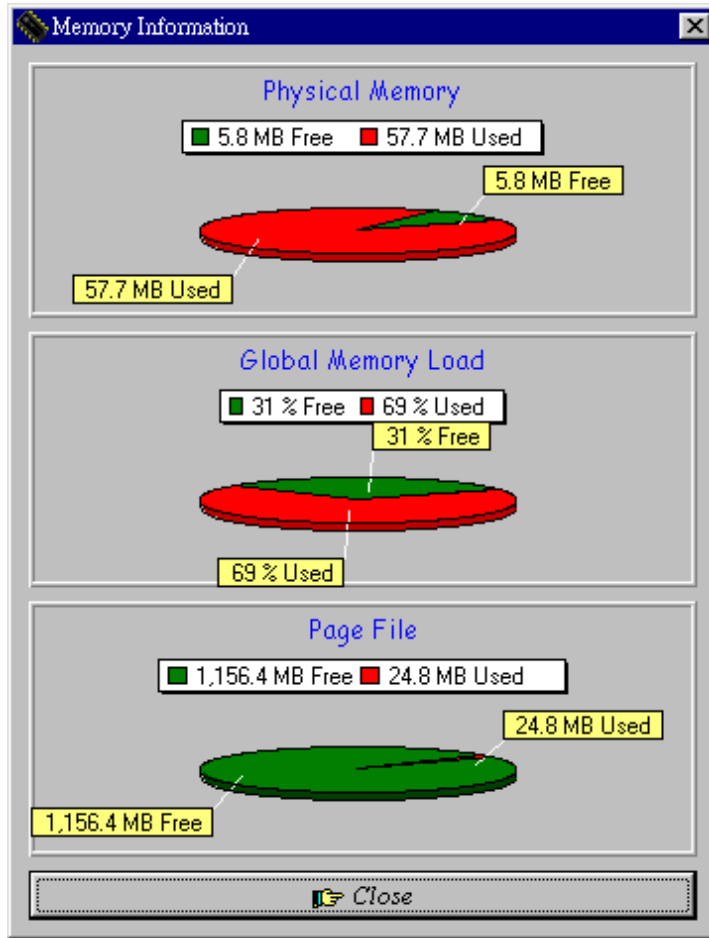
4. Fan Speed - displays the current rotational speeds of CPU and Chassis fans.
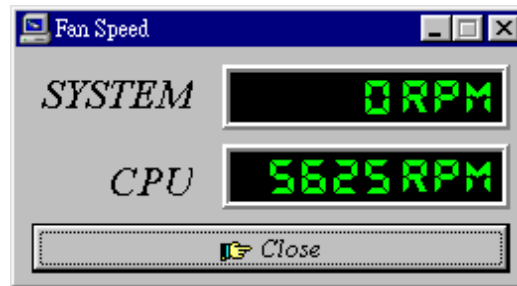
5. Disk - displays the supported disk formats and disk space.
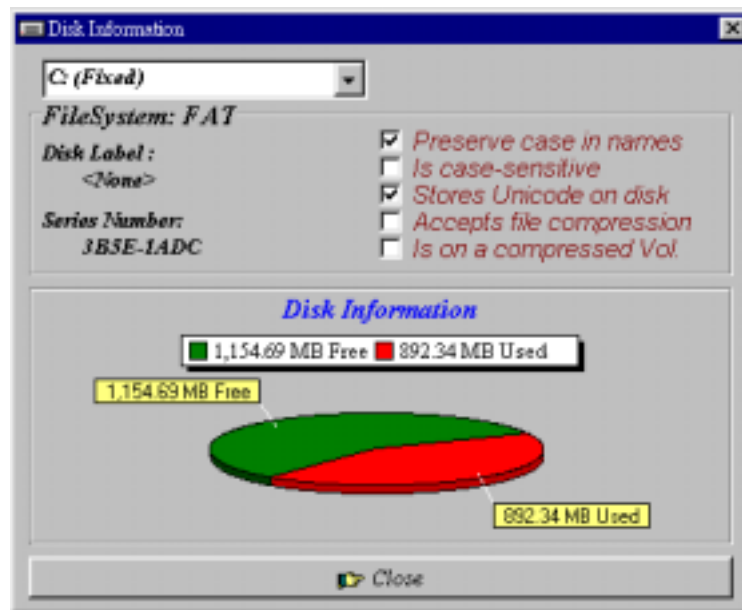
6.	Heat - displays the CPU and system temperatures.
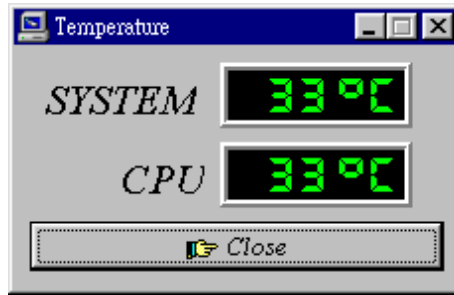
7.	Error Log - displays errors occurring after System Monitor is started.
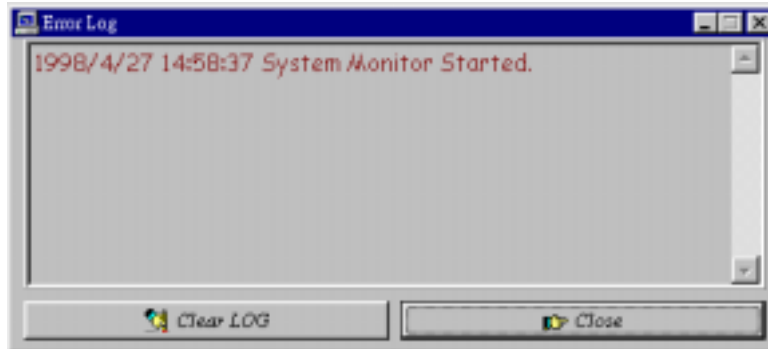
8.   Setting - sets the values at which an alarm is sounded.
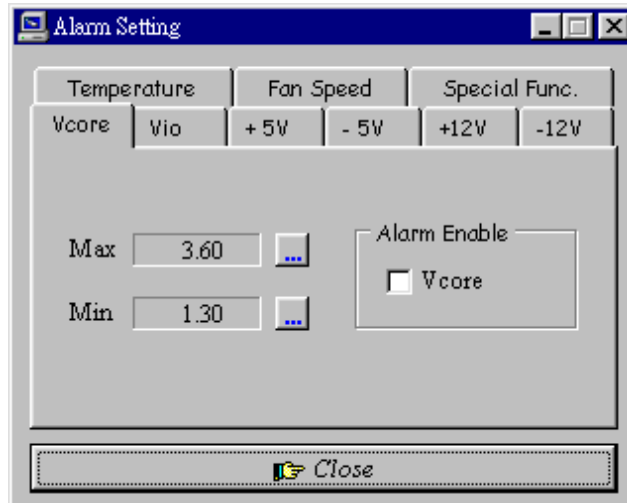
Voltage   : the acceptable voltage range between the "MAX"
                      and "MIN" value.
Temperature   : temperature threshold.
Fan Rotation Speed   : the minimum rotation speed.

NOTE: Intel has defined a margin of difference for the voltages as below:
12 Volts - 10% (10.8V ~ 13.2V)
5 Volts - 5% (4.75 ~ 5.25%)
Vio - 5% (Vio for P54C CPU is 3.5V. Vio for P55C is 3.3V.)
Vcore- 5%

9

LANDesk Client Manager

This chapter gives a brief introduction to the optional LANDesk® Client Manager (LDCM) utility, as well as the installation procedures.

The following items are covered in this chapter:

Introduction

LANDesk Client Manager (LDCM 3.1) provides the capability for managing components (network interface cards, memory, printers, software applications, etc.) within a PC system. It uses the Desktop Management Interface (DMI) standard established by the Desktop Management Task Force (DMTF). Manageable components can be viewed, monitored, and administrated across multiple platforms, either locally or remotely on a network.

The LDCM package has been implemented in two different ways: a user (client/local) version and an administrative version (Remote Companion). The user version provides the ability to only manage the local PC. The administrative version allows a network administrator to manage the local PC and other PC nodes on the network. This means that the administrative version has the ability to gather information about remote PCs, as well as remotely controlling the PCs. The remote access is based upon granted rights by the managed client.

LDCM provides the user with self-help diagnostics, including a PC health meter, local alerting of potential problems, and hardware and software inventory. Automatic polling and alerting of memory and hardware conditions and predictive failure mechanisms minimize downtime and increase effective troubleshooting. LDCM can take periodic "snapshots" of critical configuration files for easy change management and restoration when needed.

To use LDCM, your computer must meet the following requirements:
- Operating System: Windows 95, Windows NT 3.51, or Windows NT4.0
- Memory: about 200KB
- Disk Storage Space: 3-5MB
- Hardware System: a DMI BIOS is required for full LDCM functionality

For network computers, the following requirements also apply:
- Protocols: IPX or IP (WinSock-enabled) communication protocol loaded on the client
- Hardware Interfaces: a network card for communication on the network

Installation

The optional LANDesk utility that comes with the CPU card runs in Windows NT or Windows 95 operating system.

Upon entering the Windows NT 4.0 or Windows 95 environment, insert the CD. Windows will autorun the installation program and show the following screen.
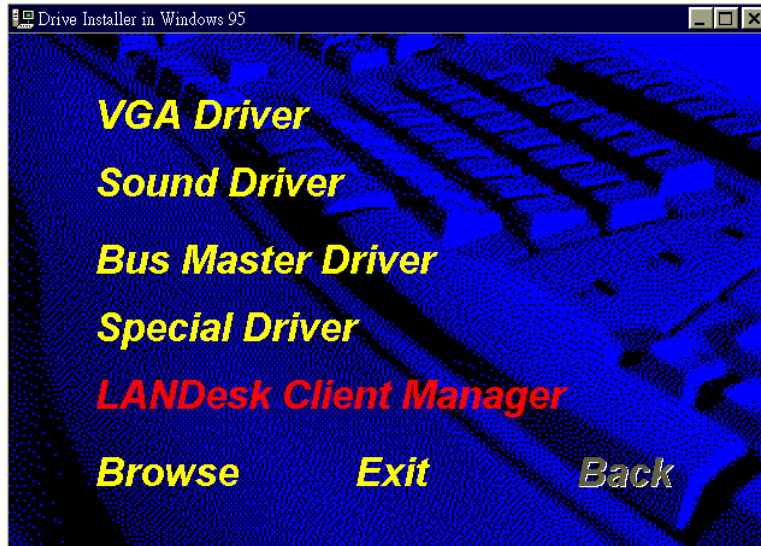

NOTE: *During Setup, you will be asked to install Internet Explorer 3.02 in order to continue, or else Setup will be aborted. LDCM supports various languages and will default to English if it is unable to load 'language.dl'..*

Installing the Local Version of LDCM
Double Click on 'LANDesk Client Manager' in the initial screen and the
following screen will appear. Double click on the local version of
LANDesk Client Manager.
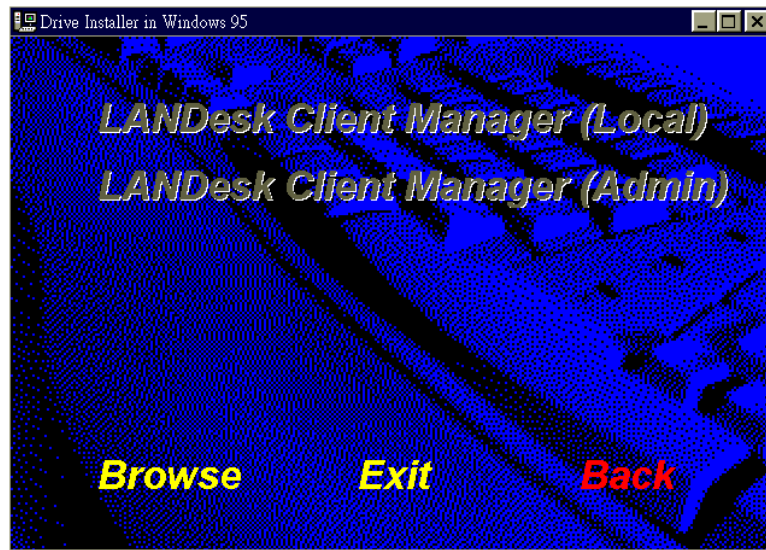
When the Welcome screen appears, click on "Next" to continue with
Setup.
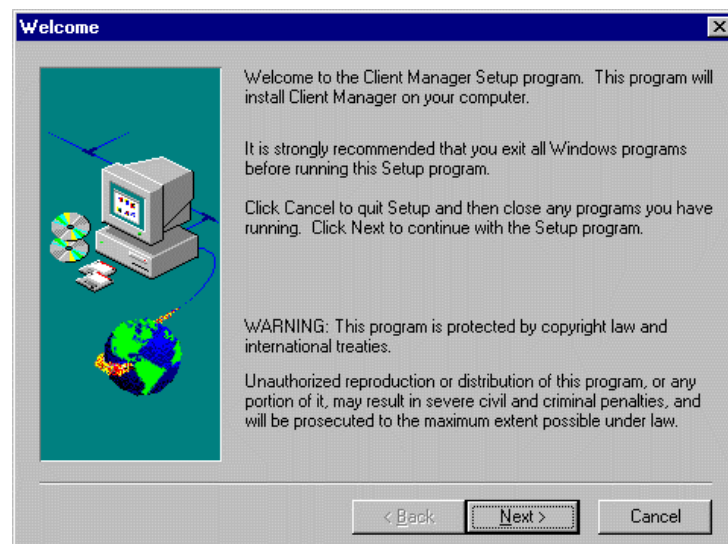
Choose the directory location where Setup will install LANDesk Client Manager. Click "Browse" if you want to change the directory suggested. Otherwise, click "Next" to start installing LDCM.
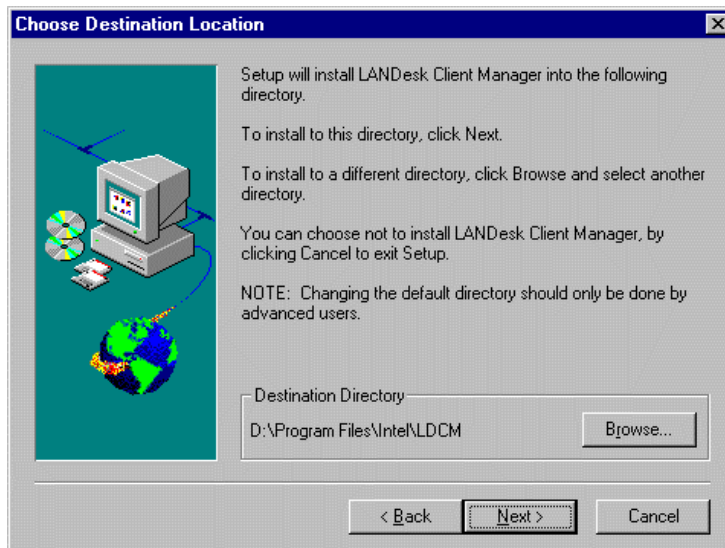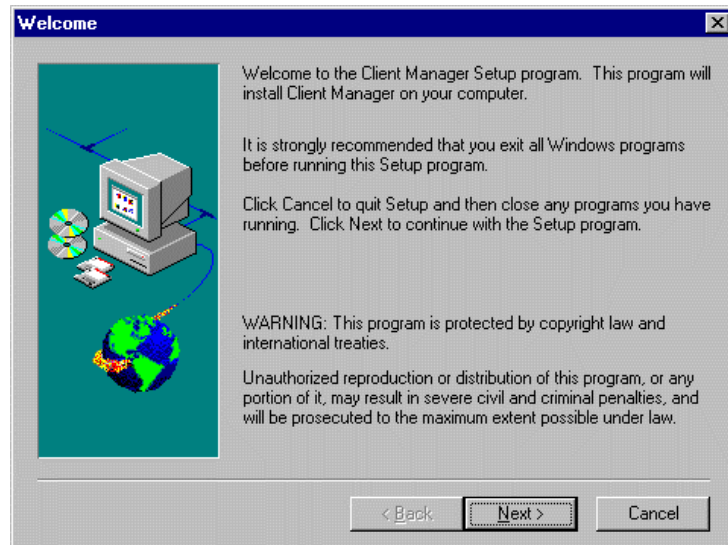

When Setup is finished, changes will have been made to the file AUTOEXEC.BAT. Restart your computer for the changes to take effect.
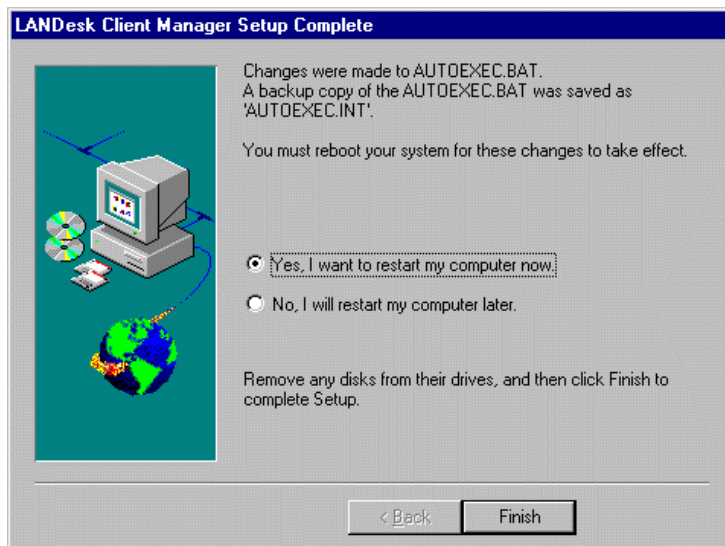
Installing the Administrative Version of LDCM
After double clicking on 'LANDesk Client Manager' in the initial screen, select the administrative version of the LDCM and the Welcome screen below will appear. Click on "Next" to continue.

The screen below allows you to install the documentation in Adobe Acrobat format and the Adobe Acrobat Reader software. Select the options you need and click on "Next" to start the installation.
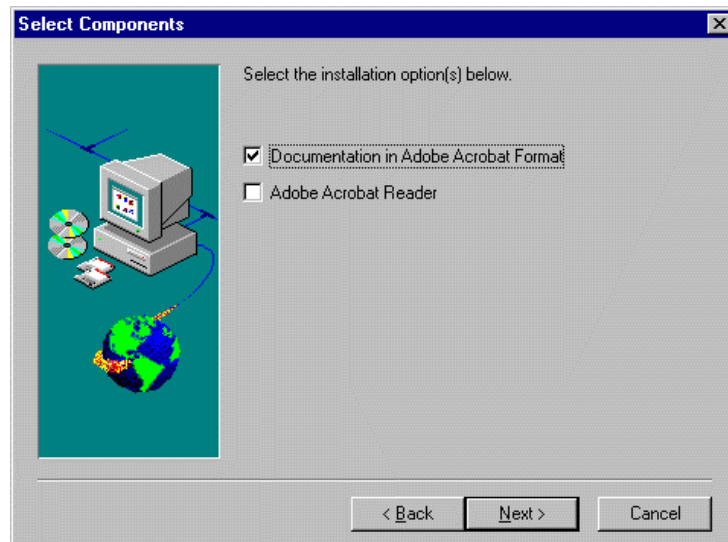
After LANDesk Client Manager Setup is complete, restart your computer to be able to use the LANDesk Client Manager.
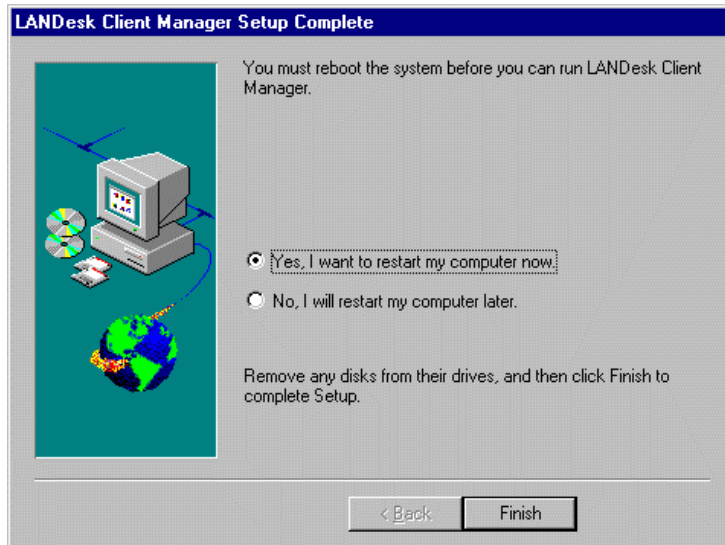
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10

SCSI Installation Guide

This chapter serves as an installation guide to the onboard SCSI interface on your CPU card. It contains important information to ease the installation and configuration process.

The onboard Adaptec AIC-7890 is a 32-bit single-chip host adapter delivering Ultra2 SCSI data transfer rates up to 40Mbyte/sec in 8-bit mode and 80Mbyte/sec in 16-bit mode to address emerging bandwidth-hungry applications. The onboard AIC-3860 transceiver chip is a critical single-ended to low voltage differential (LVD) SCSI chip that enables Ultra2 SCSI and legacy SCSI peripherals to coexist without compromising performance and extends cable lengths.

With the SCSI interface, you can connect SCSI peripherals such as hard disk drives, scanners, CD-ROM drives and tape drives.

Topics covered in this chapter include:

Installation Tips

Listed below are important compatibility/functionality tips to ease your installation and configuration process.

1. **Using Ultra2 Hard Disk Drives**

   To connect to Ultra2 drives to the Ultra2 SCSI connector, you must use the SCSI cable which has terminators.

   Attach only Ultra2 SCSI devices to the Ultra2 SCSI bus segment to ensure that Ultra devices run at their maximum 80Mbyte/sec burst rate.

2. **Using Ultra Wide SCSI Hard Disk Drives**

   To avoid termination issues, we recommend that the last device on the 68-pin Ultra Wide SCSI cable is a 68-pin Ultra Wide SCSI device.

3. **Identifying Devices at Boot-up**

   At boot-up, the SCSI interface BIOS will display the device ID's of each attached device, the bus segment to which it is attached (Ultra2 or Fast SCSI), and the mode (LVD-Ultra2 or SE-Ultra) in which it is running.

   Example:

   SCSI#1 - Seagate Caviar   Ultra2- LVD

   In this case, the term "Ultra2" indicates that the drive is attached to the Ultra2 bus segment and the term "LVD" indicates that the drive is operating at LVD-Ultra2 mode (80Mbyte/sec).

4. **Installing Windows 95 4.03**

   We recommend that you install the enclosed SCSI software after installing Windows 95 to avoid conflicts in the Device Manager with the DOS driver, ASPI8U2.SYS.

Setting up SCSI Peripherals

Setting up SCSI peripherals before attaching them to the SCSI connectors typically involves setting SCSI IDs and termination, mounting internal peripherals inside your computer, and connecting power cables to each peripheral. Since setup can vary from peripheral to peripheral, always refer to the peripheral's documentation for specific instructions. Below are some guidelines for setting SCSI IDs and termination on your peripherals.

1. **Check the SCSI IDs**

    The onboard SCSI interface and each peripheral you connect require a unique SCSI ID number. ID numbers don't have to be sequential, as long as the SCSI interface and each peripheral has a different number.

    If you will be booting from a SCSI hard disk, it's best to set the disk's ID at 0 or 1. Most SCSI hard disks come from the factory preset to ID 0. The IDs for internal peripherals are usually set with jumpers; external peripherals are usually set with a switch on the back of the peripheral.

2. **Terminate the Ends**

    To ensure reliable communication on the SCSI bus, the peripheral at the end of each cable, or the end of the cable itself, must have a terminator installed (or enabled). The peripherals between the ends of each cable must have the terminator removed (or disabled).

Connecting SCSI Peripherals

Before connecting peripherals to the SCSI interface, be sure to also review *Setting Up SCSI Peripherals* on the last section.

1. 68-pin Internal Ultra2 SCSI Connector

Use the 68-pin internal Ultra2 SCSI connector to connect internal Ultra2 peripherals. The connector is an Ultra2 Low Voltage Differential, Single Ended (Ultra2-LVD/SE) connector. The internal Ultra2 cable included in the package allows up to four internal Ultra2 peripherals. If you have more than four Ultra2 peripherals, you will need to obtain an Ultra2 cable with enough connectors to accommodate all your Ultra2 peripherals. Follow these steps to connect your internal Ultra2 peripherals:

NOTE: We recommend keeping your Ultra2 peripherals separate from your non-Ultra2 peripherals. Connecting a non-Ultra2 peripheral to the Ultra2 SCSI connector forces the Ultra2 SCSI segment and any attached peripherals to drop down to Ultra SCSI performance levels (40Mbytes/sec).

Step 1: Locate the 68-pin internal Ultra2 SCSI cable in the package.

Step 2: Plug the long end of the cable to the Ultra2 SCSI connector CPU card.

Step 3: Plug the remaining connectors to your internal Ultra2 SCSI peripherals.
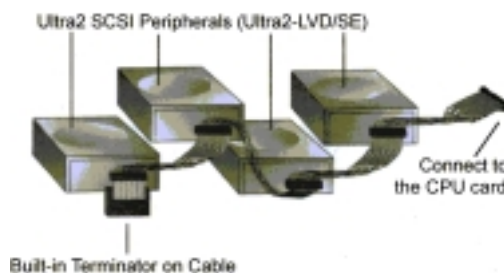
NOTE: Internal Ultra2 SCSI peripherals come from the factory with termination disabled and cannot be changed. Proper termination is provided by the built-in terminator at the end of the Ultra2 internal SCSI cable provided in the kit.

Installing the SCSI software driver

To install the SCSI software driver, go to the section below for the operating system (for example, Windows 95) installed on your computer. If the operating system is not yet installed, install it now. Refer to your operating system documentation for instructions.

Computers with Windows 95
1. Turn on all external peripherals and then the computer. Windows 95 now will recognize the SCSI interface in your computer and will ask you to select which driver you want to install.
2. Select "Driver from disk provided by hardware manufacturer," then click **OK**.
3. Insert the SCSI driver diskette in your floppy disk drive, then click **OK**.
4. Follow the instructions that appear onscreen.

Computers with Windows NT
1. Turn on all external peripherals and then the computer.
2. Start Windows NT on your computer.
3. Insert the SCSI driver diskette in your floppy disk drive.
4. Click the Start button, then click **Run**.
5. When the Run dialog box appears, type **a:\setup** if you are using the A drive, or **b:\setup** if you are using the B drive. Then click **OK**.
6. Follow the instructions that appear onscreen.

Configuring the SCSI Interface with SCSISelect

SCSI*Select,* included with the package, enables you to change SCSI settings without opening the computer. SCSI*Select* also enables you to low-level format or verify the disk media of your SCSI hard disk drives. Table 1 lists the available and default settings for each SCSI*Select* option.

NOTE: The default settings are appropriate for most systems. Run SCSISelect if you need to change or view current settings, or if you would like to run the SCSI disk utilities.

Table 1. SCSISelect Settings

SCSISelect Option	Available Settings	Default Setting
Basic Host Adapter Settings		
Host Adapter SCSI ID	0-15	7
SCSI Parity Checking	Enabled, Disabled	Enabled
Host Adapter SCSI Termination		
Ultra2-LVD/SE Connector	Automatic, Enabled, Disabled	Automatic
Fast/Ultra-SE Connector	Automatic Low ON/High ON, Low OFF/High OFF, Low OFF/High ON	Automatic
Boot Device Settings:		
Boot SCSI ID	0-15	0
Boot LUN Number*	0-7	0
SCSI Device Configuration:		
Initiate Sync Negotiation	Yes, No	Yes (Enabled)
Maximum Sync Transfer Rate	80.0, 53.4, 40.0, 32.0, 26.8, 20.0, 16.0, 13.4, 10.0	80.0
Enable Disconnection	Yes, No	Yes (Enabled)
Initiate Wide Negotiation	Yes, No	Yes (Enabled)
Send Start Unit Command	Yes, No	Yes (Enabled)
BIOS Multiple LUN Support	Yes, No	No (Disabled)
Include in BIOS Scan	Yes, No	Yes (Enabled)
Advanced Host Adapter Settings:		
"Plug-and-Play"SCAM Support	Enabled, Disabled	Disabled
Reset SCSI Bus at IC Initialization	Enabled, Disabled	Enabled
Extended BIOS Translation for DOS Drives>1Gbyte**	Enabled, Disabled	Enabled
Host Adapter BIOS	Enabled, Disabled	Enabled
Support Removable Disks Under BIOS as Fixed Disks**	Boot Only, All Disks, Disabled	Boot Only
Display <Ctrl> <A> Messages during BIOS Initialization	Enabled, Disabled	Enabled
BIOS Support for Bootable CD-ROMs**	Enabled, Disabled	Enabled
BIOS Support for Int 13 Extensions**	Enabled, Disabled	Enabled

* Setting is valid only if Multiple LUN Support is enabled.
** Settings are valid only if host adapter BIOS is enabled.

Starting SCSISelect
Follow these steps to start SCSISelect:
1.   Turn on or restart your system.
      During the startup process, pay careful attention to the messages that
      appear on your screen.
2.   When the following message appears on your screen, press the
      Ctrl-A keys simultaneously (this messages appears for only a few
      seconds):
      Press <Ctrl><A> for SCSISelect ™ Utility!
3.   From the menu that appears, use the ↑ and ↓ keys to move the cursor
      to the option you want to select, then press **Enter**.

*NOTE: If you have difficulty viewing the display, press **F5** to toggle*
between color and monochrome modes. (This feature may not work on all
monitors.)

Exiting SCSI*Select*
Follow these steps to exit SCSI*Select*:
1.   Press **Esc** until a message prompts you to exit (if you changed any
      settings, you are prompted to save the changes before you exit).
2.   At the prompt, select **Yes** to exit, then press any key to reboot the
      computer. Any changes you made in SCSI*Select* take effect after the
      computer boots.

Using SCSI*Select* Settings
To select an option, use the ↑ and ↓ keys to move the cursor to the option
you want to select, then press **Enter**.

In some cases, selecting an option displays another menu. You can return
to the previous menu at any time by pressing **Esc**.

To restore the original SCSI*Select* default values, press **F6** from the main
SCSI*Select* screen.

Basic Host Adapter Settings

Host Adapter SCSI ID: Sets the SCSI ID for the SCSI interface. The SCSI interface is set at 7, which gives it the highest priority on the SCSI bus. We recommend you not to change this setting.

SCSI Parity Checking: when set to **Enable**, verifies the accuracy of data transfer on the SCSI bus. Leave this setting enabled unless any SCSI peripheral connected to the SCSI connectors does not support SCSI parity.

Host Adapter SCSI Termination: Determines the termination setting for the SCSI interface. The default setting for both the Ultra2-LVD/SE connector and Fast/Ultra-SE connector is **Automatic**.

Boot Device Options

Boot Target ID: Specifies the SCSI ID of your boot device

Boot LUN Number: Specifies which LUN (Logical Unit Numbers) to boot from your boot device. Multiple LUN Support must be enabled. (*see Advanced Configuration Options* on the next page.)

SCSI Device Configuration

NOTE: To configure settings for a SCSI peripheral, you must know its SCSI ID (see Using SCSI Disk Utilities on page 78).

Initiate Sync Negotiation: when set to **Yes**, initiates synchronous data transfer negotiation (Sync Negotiation) between the peripheral and SCSI interface. Leave this setting set to **Yes** unless any attached SCSI peripheral connected to the SCSI interface does not support synchronous negotiation.

Maximum Sync Transfer Rate: Determines the maximum synchronous data transfer rate the SCSI interface supports. Use the maximum value of 80.0. If you peripheral is not Ultra SCSI, select a transfer rate of 10.0.

Enable Disconnection: When set to **Yes**, allows the SCSI peripheral to disconnect from the SCSI bus. Leave the setting at **Yes** if two or more SCSI peripherals are connected to the SCSI interface. If only one SCSI peripheral is connected, changing the setting to **No** results in slightly better performance.

Initiate Wide Negotiation: When set to **Yes**, the SCSI interface attempts 16-bit data transfer (wide negotiation). When set to **No**, the SCSI interfaces uses 8-bit data transfer unless the SCSI peripheral requests wide negotiation.

*NOTE: Set Initiate Wide Negotiation to **No** if you are using an 8-bit SCSI peripheral that hangs or exhibits other performance problems with 16-bit data transfer.*

Send Start Unit Command: When set to **Yes**, sends the Start Unit Command to the SCSI peripheral at bootup.

BIOS Multiple LUN Support: When set to **Yes**, the SCSI interface BIOS provides boot support for a SCSI peripheral with multiple LUNs. Leave this setting set to **No** if your boot device does not have multiple LUNs.

Include in BIOS Scan: When set to **Yes**, the SCSI card BIOS includes the peripheral as part of its BIOS scan at bootup.

Advanced Configuration Options

NOTE: Do not change the Advanced Host Adapter Settings unless absolutely necessary.

Plug-and-Play SCAM Support: When set to **Enable**, the SCSI interface automatically assigns SCSI IDs to SCSI peripherals that support the SCAM protocol. The default is **Disable**, but you can set it to **Enable** even if you have a non-SCAM peripheral.

Reset SCSI Bus at IC Initialization: When set to **Enable**, the SCSI interface generates a SCSI bus reset during its power-on initialization and after a hard reset.

Extended BIOS Translation for DOS Drives >1Gbyte: When set to **Enable**, provides an extended translation scheme for SCSI hard disks with capacities greater than 1Gbyte. This setting is necessary only for MS-DOS 5.0 or above; it is not required for other operating systems, such as NetWare or UNIX. The extended translation scheme supports disk drives as large as 8Gbytes.

To partition a disk larger than 1Gbyte controlled by the SCSI interface BIOS, use the MS-DOS Fdisk command.

CAUTION: Back up your disk drives before changing the translation scheme.

Host Adapter BIOS (Configuration Utility Reserves BIOS Space): Enables or disables the SCSI interface BIOS.

> Set to **Enable** if you boot from a SCSI disk drive connected to the SCSI interface.

> Set to **Disable** if the peripherals on the SCSI bus (for example, CD-ROM drives) are controlled by software drivers and do not need the BIOS.

Support Removable Disks Under BIOS as Fixed Disks: Determines which removable-media drives are supported by the SCSI card BIOS. Choices are as follows:

> **Boot Only:** Only the removable-media drive designated as the boot device is treated as a hard disk drive.

> **All disks:** All removable-media drives supported by the BIOS are treated as hard disk drives.

> **Disabled:** No removable-media drives are treated as hard disk drives. Software drivers are required because the drives are not controlled by the BIOS.

*CAUTION: Do not remove a removable-media cartridge from a SCSI drive controlled by the SCSI interface BIOS while the drive is on. You may lose data. To allow removability of the media while the drive is on, install the removable-media software driver and set **Support Removable Disks Under BIOS as Fixed Disks** to **Disabled**.*

Display <Ctrl><A> Messages during BIOS Initialization: When set to **Enable**, the SCSI card BIOS displays the Press <Ctrl><A> for SCSISelect ™ Utility! Messages on your screen during system bootup. If this setting is disabled, you can invoke the SCSISelect Utility by pressing **<Ctrl><A>** after the SCSI card BIOS banner appears.

BIOS Support for Bootable CD-ROMs: When set to **Enable**, the SCSI interface BIOS supports Int 13h extensions as required by Plug-and-Play. The setting can be either enabled or disabled if your system is not Plug-and-Play.

Using SCSI Disk Utilities

To access the SCSI disk utilities, follow these steps:

1. Select the **SCSI Disk Utilities** option from the menu that appears after starting SCSI*Select*. SCSI*Select* scans the SCSI bus (to determine the devices installed) and displays a list of all SCSI IDs and the devices assigned to each ID.
2. Use the ↑ and ↓ keys to move the cursor to a specific ID and device, then press **Enter**.
3. A small menu appears, displaying the options Format Disk and Verify Disk Media

Format Disk: Allows you to perform a low-level format on a hard disk drive. *Most SCSI disk devices are preformatted at the factory and do not need to be formatted again.* Each hard disk drive must be low-level formatted before you can use your operating system's partitioning and file preparation utilities, such as MS-DOS Fdisk and Format.

*CAUTION: A low-level format destroys all data on the drive. Be sure to back up your data before performing this operation. You **cannot** abort a low-level format once it is started.*

Verify Disk Media: Allows you to scan the media of a hard disk drive for defects. If the utility finds bad blocks on the media, it prompts you to reassign them; if you select *yes*, those blocks are no longer used. You can press **Esc** at any time to abort the utility.

Appendix

A. I/O Port Address Map
B. Interrupt Request Lines (IRQ)

A. I/O Port Address Map

Each peripheral device in the system is assigned a set of I/O port addresses, which also becomes the identity of the device. There is a total of 1K port address space available. The following table lists the I/O port addresses used on the Industrial CPU Card.

Address	Device Description
000h - 01Fh	DMA Controller #1
020h - 03Fh	Interrupt Controller #1
040h - 05Fh	Timer
060h - 06Fh	Keyboard Controller
070h - 07Fh	Real Time Clock, NMI
080h - 09Fh	DMA Page Register
0A0h - 0BFh	Interrupt Controller #2
0C0h - 0DFh	DMA Controller #2
0F0h	Clear Math Coprocessor Busy Signal
0F1h	Reset Math Coprocessor
1F0h - 1F7h	IDE Interface
278 - 27F	Parallel Port #2(LPT2)
2F8h - 2FFh	Serial Port #2(COM2)
2B0 - 2DF	Graphics adapter Controller
378h - 3FFh	Parallel Port #1(LPT1)
360 - 36F	Network Ports
3B0 - 3BF	Monochrome & Printer adapter
3C0 - 3CF	EGA adapter
3D0 - 3DF	CGA adapter
3F0h - 3F7h	Floppy Disk Controller
3F8h - 3FFh	Serial Port #1(COM1)

B. Interrupt Request Lines (IRQ)

There are a total of 15 IRQ lines available on the Industrial CPU Card. Peripheral devices use interrupt request lines to notify CPU for the service required. The following table shows the IRQ used by the devices on the Industrial CPU Card.

Level	Function
IRQ0	System Timer Output
IRQ1	Keyboard
IRQ2	Interrupt Cascade
IRQ3	Serial Port #2
IRQ4	Serial Port #1
IRQ5	Parallel Port #2
IRQ6	Floppy Disk Controller
IRQ7	Parallel Port #1
IRQ8	Real Time Clock
IRQ9	Software Redirected to Int 0Ah
IRQ10	Reserved
IRQ11	Reserved
IRQ12	Reserved
IRQ13	80287
IRQ14	Primary IDE
IRQ15	Secondary IDE