

## **PCI-6870 series**

Socket 370 Pentium® III/Celeron™  
Half-sized CPU Card with High Speed  
PCI Bus, VGA, Fast Ethernet and  
CompactFlash Type II card

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This manual is for the PCI-6870 Series Rev. A1

Part No. 200K687001  
Printed in Taiwan

3<sup>rd</sup> Edition  
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## Packing List

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Before installing your board, ensure that the following materials have been received:

- 1 ea. PCI-6870 SBC
- 1 ea. Keyboard/Mouse cable (1700060202)
- 1 ea. COM port cable (1700100250)
- 1 ea. LPT cable (1700260250)
- 1 ea. Power cable (1703080101)
- 1 ea.FDD cable (1703340400)
- 1 ea.IDE cable (1701400452)
- 1 ea. Startup Manual
- 1 ea. CD (Driver & utility)
- 1 ea. Warranty card

*Note 1: For detailed contents of the PCI-6870 series, please refer to the enclosed CD-ROM or disk (in PDF format).*

If any of these items are missing or damaged, contact your distributor or sales representative immediately.

## Optional Devices

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- 1759209100 Fan/Heatsink module
- 9689000042 IrDA adapter
- 1703100260 USB cable adapter
- 1700160160 Audio cable
- CF-HDD-ADP CompactFlash 50-pin to IDE 44-pin adapter

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# CHAPTER 1

## General Information

This chapter gives background information on the PCI-6870.

Sections include:

- Introduction
- Features
- Specifications
- Board layout and dimensions

## 1.1 Introduction

---

The PCI-6870 all-in-one industrial grade PCI-bus CPU card uses Intel's highly acclaimed Celeron® processor or Pentium® III processor, together with the Intel 815E PCI chipset.

The CPU provides 128/256 KB (or 256/512 KB for Pentium III) on-CPU L2 cache, eliminating the need for external SRAM chips. It has two PCI EIDE interfaces for up to four devices and a floppy disk drive interface for up to two devices. Other features include two serial ports (16C550 UARTs with 16-byte FIFO or compatible), one enhanced parallel port (supports SPP/EPP/ECP) and two USB (Universal Serial Bus) ports. The PCI enhanced IDE controller supports Ultra DMA100, Ultra DMA33 and PIO Mode 4 operation. This provides data transfer rates of over 33 MB/sec. System BIOS supports boot-up from an IDE, CD-ROM, USB devices, and LS-120.

A backup of CMOS data is stored in the Flash memory, which protects data even after a battery failure. Also included is a 62-level Watchdog timer which resets the CPU or generates an interrupt if a program cannot be executed normally. This enables reliable operation in unattended environments.

The PCI-6870 offers several impressive industrial features such as VGA (AGP) controller, one DIMM slot for up to 512 MB RAM memory and a 10/100Base-T Ethernet controller. In addition, the PCI-6870 series supports a solid state disk (SSD) using a CompactFlash™ Type II disk that is not as vulnerable to the hazards of an industrial computing environment. These features make it an ideal choice for applications that require both high performance and full functionality.

## 1.2 Specifications

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### Standard SBC functions

- **CPU:** Socket 370 for Intel® Pentium III processors up to 1.26 GHz, and Celeron™ processor up to 1.2 GHz (The original Intel heatsink for this CPU card is no longer available; if you need a heatsink, you can use the Advantech Fan/heatsink module (Advantech P/N:1759209100).
- **BIOS:** 2 Mbit Flash BIOS,
  - Supports Plug & Play, APM 1.2
  - Supports Ethernet Boot ROM
  - Supports boot from USB device
  - Supports boot from CD-ROM
  - Supports boot from LS-120 ZIP™ Drive
  - Optional Customer icon
- **Chipset:** Intel® 815E PCI set, FSB 133/100 MHz
- **2<sup>nd</sup> level cache:** 512/256 KB on Pentium III or 256/128 KB on Celeron™ Processor
- **System memory:** One 168-pin DIMM socket, supports 8 MB to 512 MB, accepts 8/16/32/64/128 MB Synchronous DRAM
- **PCI IDE interface:** Two Enhanced IDE interfaces, support 4 IDE devices. Channel One supports up to UltraDMA 100. Channel Two supports PIO mode 3,4 with bus mastering up to 33MB/sec.
- **Floppy disk drive interface:** Supports up to two FDDs (360 KB/720 KB/1.2 MB/1.44 MB/2.88 MB) with Hirose 20 pin FDD connector
- **Parallel port:** One parallel port, supports EPP/ECP
- **IR port:** One 115 kbps IrDA compliant serial infrared
- **Serial ports:** 2 serial ports  
COM1: RS-232, COM2: RS-232/422/485
- **Watchdog timer:** 62 levels timer interval, setup by software, jumperless selection, generates system reset.

### VGA function

## **AGP SVGA Interface**

- **Chipset:** Intel 815E embedded
- **Display memory:** Shares system memory up to 4MB
- **Display type:** CRT
- **Interface:** Direct AGP, Accelerator Graphics Ports 1.0 compliant
- **Display mode:** CRT display supports up to 800 x 600 @ 24 bpp, 1024 x 768 @ 24 bpp

## **Ethernet controller functions**

- Intel 815E Chipset MAC embedded + 82562ET PHY  
PCI Ethernet controller, IEEE 802.3 protocol compatible  
Supports 10/100 Mbps Base-T

## **Solid state disk**

- Supports CompactFlash™ Type I/II disks

## **Mechanical and environmental specifications**

- Standard Mode Power Consumption  
6.68 A @ 5 V with Pentium III 850 and 256MB DIMM
- **Operating temperature:**  
0 ~ 60° C (32 ~ 140° F)
- **Size:** 185 mm x 122 mm
- **Weight:** 0.27 kg

## 1.3 Features

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- Supports Socket 370 for Intel® Pentium® III/Celeron™ processor (The Intel original heatsink is unavailable for this CPU card. See section 1.2 Specifications for alternative.)
- Direct AGP supports 24 bit CRT
- USB interface compliant with USB rev. 1.1
- System overheat temperature control
- 62-levels Watchdog timer with system reset or IRQ11
- Supports both wake on LAN and wake on modem
- Supports PCI interface compliant with PCI rev. 2.1
- Supports four PCI Bus masters

## 1.4 Board layout: Dimensions

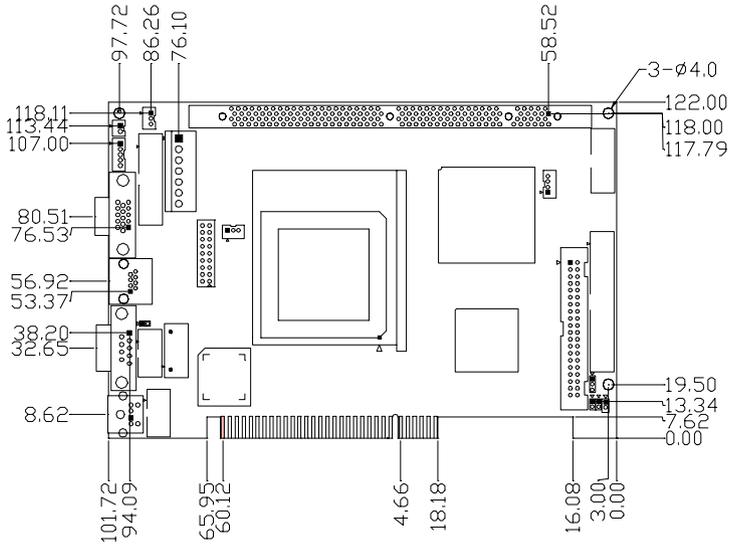


Figure 1-1: PCI-6870 dimensions (component side)

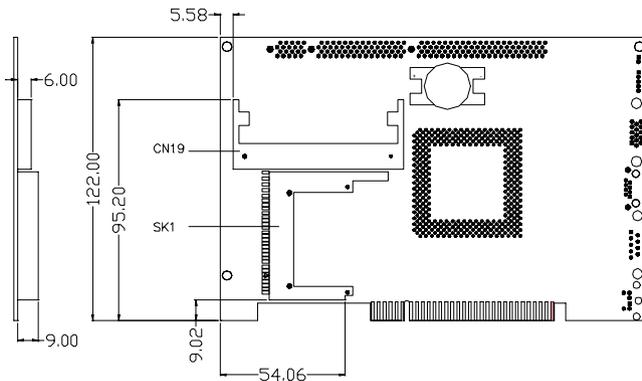


Figure 1-2: PCI-6870 dimensions (solder side)

# CHAPTER 2

## Installation

This chapter tells how to set up the PCI-6870 hardware. It includes instructions on setting jumpers, and connecting peripherals, switches and indicators. Be sure to read all the safety precautions before you begin the installation procedure.

## 2.1 Safety Precautions

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Follow these simple precautions to protect yourself from harm and your PC from damage.

1. To avoid electric shock, always disconnect the power from your PC chassis before you work on it. Don't touch any components on the CPU card or other cards while the PC is on.
2. Disconnect power before making any configuration changes. The sudden rush of power as you connect a jumper or install a card may damage sensitive electronic components.
3. Always ground yourself to remove any static charge before you touch your CPU card. Be particularly careful not to touch the chip connectors. Modern integrated electronic devices, especially CPUs and memory chips, are extremely sensitive to static electric discharges and fields. Keep the card in its antistatic packaging when it is not installed in the PC, and place it on a static dissipative mat when you are working with it. Wear a grounding wrist strap for continuous protection.

## 2.2 Jumpers

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The PCI-6870 has a number of jumpers that allow you to configure your system to suit your application. The table below lists the function of each of the board's jumpers.

---

Table 2-1: Jumpers

---

Label	Function
J2	reserve (FWH)
J3	RS-232/422/485 select
J4	clear CMOS
J5	watchdog timer enable
J6	reset
J7	HDD LED
J8	Power LED

---

## 2.3 Connectors

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On-board connectors link the PCI-6870 to external devices such as hard disk drives, a keyboard, or floppy drives. The table below lists the function of each of the board's connectors.

---

Table 2-2: Connectors

---

<b>Label</b>	<b>Function</b>
SK1	CompactFlash Type II
CN1	IrDA
CN2	VGA
CN3	COM 1
CN4	PS/2 Keyboard
CN5	RJ45 with LED
CN6	ATX con (WHL3V-2M)
CN7	Printer port connector
CN8	COM 2
CN9	USB x 2
CN11	EBX power
CN12	CPU fan
CN13	ATX PS-ON SW
CN14	CDROM-IN
CN15	Primary IDE (ATA100)
CN16	Serial IRQ
CN17	Audio connector
CN18	Secondary IDE (ATA33)
CN19	Video Expansion connector
CN20	FDD connector

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## 2.3.1 Locating Jumpers and Connectors

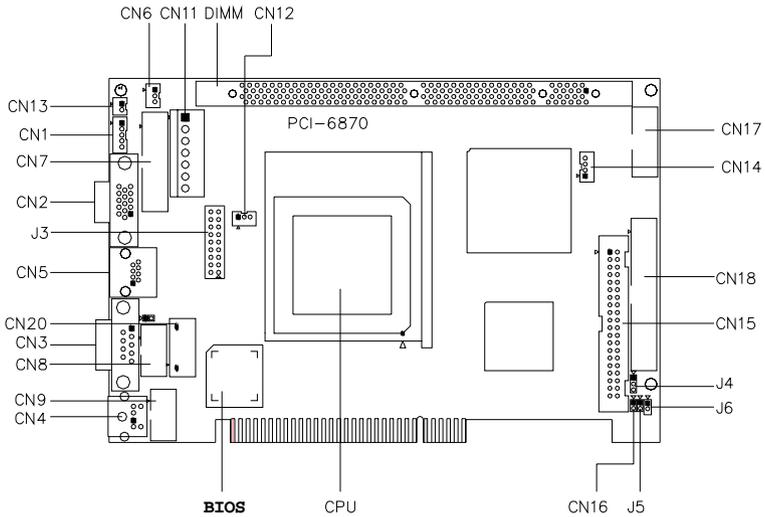
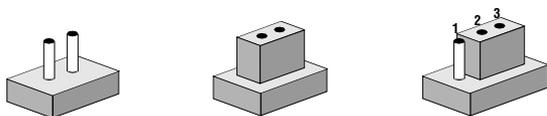


Figure 2-1: Locating connectors (component side)

## 2.4 Setting jumpers

You configure your card to match the needs of your application by setting jumpers. A jumper is the simplest kind of electric switch. It consists of two metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To “close” a jumper, connect the pins with the clip. To “open” a jumper, remove the clip. Sometimes a jumper will have three pins, labeled 1, 2, and 3. In this case, you would connect either pins 1 and 2 or 2 and 3.

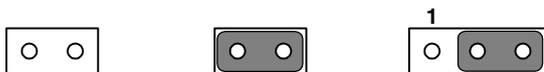


*Open*

*Closed*

*Closed 2-3*

The jumper settings are schematically depicted in this manual as follows:



*Open*

*Closed*

*Closed 2-3*

A pair of needle-nose pliers may be helpful when working with jumpers. Setting switches is slightly different but more simple. Simply slide the desired switch to the **on** or **off** position. In the example below, the 6 element switch would be. 1:off, **2:on**, 3:off, 4:off, 5:off, 6:off.



If you have any doubts about the best hardware configuration for your application, contact your local distributor or sales representative.

## 2.4.1 COM2 settings for RS-232/422/485 (J3)

Table 2-3: COM2 settings for RS-232/422/485 (J3)

### Jumper positions

RS-232*	(5-6)*	(7-9)*	(8-10)*	(13-15)*	(14-16)*
RS-422	(3-4)	(9-11)	(10-12)	(15-17)	(16-18)
RS-485	(1-2)	(9-11)	(10-12)	(10-12)	(10-12)

\* default setting

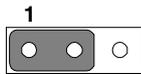
## 2.4.2 CMOS clear function (J4)

*Warning: To avoid damaging the computer, always turn off the power supply before setting "Clear CMOS". Set the jumper back to normal before turning on the power supply.*

Table 2-4: RTC power and CMOS clear (J4)

**\*Normal**

**CMOS data clear**



\* default setting

### 2.4.3 Watchdog timer config. (J5)

An on-board watchdog timer reduces the chance of disruptions which EMP (electro-magnetic pulse) interference can cause. This is an invaluable protective device for standalone or unmanned applications. Setup involves one jumper and running the control software. (Refer to Appendix A.)

When the watchdog timer is enabled and the CPU shuts down, the watchdog timer will automatically reset the system.

Table 2-5: Watchdog timer (J5)

Pin 1-2	Function
closed	enable*
open	disable



enable\*



disable

\* default setting

### 2.4.4 Hardware Reset (J6)

If you install a reset switch, it should be an open single pole switch. Momentarily pressing the switch will activate a reset. The switch should be rated for 10 mA, 5 V.

### 2.4.5 HDD LED (J7)

Basic HDD activity indicator. Connect an LED to J12, and when there is disk activity, the LED lights up.

### 2.4.6 Power LED (J8)

J8 is for your basic power on indicator. Connect an LED to J8, and when system power is on, the LED will be on.

## 2.5 Installation Caution

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The following sections tell how to make each connection. In most cases, you will simply need to connect a standard cable. All of the connector pin assignments are shown in Appendix C.

**Warning!** *Always completely disconnect the power cord from your chassis whenever you are working on it. Do not make connections while the power is on. Sensitive electronic components can be damaged by a sudden rush of power. Only experienced electronics personnel should open the PC chassis.*



**Caution!** *Always ground yourself to remove any static charge before touching the CPU card. Modern electronic devices are very sensitive to static electric charges. Use a grounding wrist strap at all times. Place all electronic components on a static-dissipative surface or in a static-shielded bag when they are not in the chassis.*



### 2.5.1 IrDA Connector (CN1)

This connector supports the optional wireless infrared transmitting and receiving module. This module mounts on the system case. You must configure the setting through BIOS setup.

### 2.5.2 VGA Display Connector (CN2)

The PCI-6870 provides a VGA controller for a high resolution VGA interface. The PCI-6870 CN2 is a DB-15 connector for VGA monitor input. Pin assignments for the CRT display are detailed in Appendix C.

### **2.5.3 RS-232 connector (COM1-CN3)**

Different devices implement the RS-232 standard in different ways. If you are having problems with a serial device, be sure to check the pin assignments for the connector.

### **2.5.4 Keyboard & PS/2 Mouse Connector (CN4)**

The PCI-6870 board provides a keyboard connector. A 6-pin mini-DIN connector (CN4) on the card mounting bracket supports single-board computer applications. The card comes with an adapter to convert from the 6-pin mini-DIN connector to a standard DIN connector and to a PS/2 mouse connector.

### **2.5.5 Ethernet Configuration**

The PCI-6870 is equipped with a high performance 32-bit PCI-bus Fast Ethernet interface which is fully compliant with IEEE 802.3u 10/100Base-T specifications. It is supported by all major network operating systems.

The medium type can be configured via the **RSET8139.EXE** program included on the utility disk. (See Chapter 5 for detailed information.)

### **RJ-45 connector with LED (CN5)**

10/100Base-T connects to the PCI-6870 via an adapter cable to the RJ-45 standard jack.

### **Network boot**

The network boot feature is built into the BIOS. It can be enabled or disabled in the chipset setup of the CMOS configuration. Refer to "BIOS Setting" in Chapter 3 for more information.

## 2.5.6 ATX Feature Connector (CN6)

When the PCI-6870 is used as a stand alone card, both the 7-pin main power connector (CN11) and the ATX feature connector (CN6) must be connected to the power supply. If the PCI-6870 is used with a passive backplane, the main power connector (CN11) should not be connected as the card will be powered from the backplane.

The ATX adapter cable (optional) is used to connect the PCI-6870 to the ATX power supply. The ATX adapter cable has different connectors at both ends. On one end is the ATX 20-pin (female type) which connects to the (male) ATX power supply source. The other end has a 3-pin connector (female type) which connects to the ATX feature connector (CN6) on the board itself. This end also has the 7-pin main power connector (CN11).

## 2.5.7 Parallel Port Connector (CN7)

The parallel port is normally used to connect the CPU card to a printer. The PCI-6870 includes an on-board parallel port, accessed through a 26-pin flat-cable connector, CN7. The card comes with an adapter cable which lets you use a traditional DB-25 connector. The cable has a 26-pin connector on one end and a DB-25 connector on the other, mounted on a retaining bracket. The bracket installs at the end of an empty slot in your chassis, giving you access to the connector.

The parallel port is designated as LPT1, and can be disabled or changed to LPT2 or LPT3 in the system BIOS setup.

To install the bracket, find an empty slot in your chassis. Unscrew the plate that covers the end of the slot. Screw in the bracket in place of the plate. Next, attach the flat-cable connector to CN7 on the CPU card. Wire 1 of the cable is red or blue, and the other wires are gray. Make sure that wire 1 corresponds to pin 1 of CN7. Pin 1 is on the right side of CN7.

## 2.5.8 RS-232/422/485 connector (CN8) (COM2:RS-232/422/485)

COM2 is an RS-232/422/485 serial port. The specific port type is determined by jumper settings (J3), as detailed in Section 2.4.1.

The IRQ and address range for both ports are fixed. However, if you wish to disable the port or change these parameters later, you can do this in the system BIOS setup. The table below shows the settings for the PCI-6870 board's ports:

Table 2-6: PCI-6870 serial port default settings

Port	Address	Interrupt	Default
COM1	3F8, 3E8	IRQ4	3F8
COM2	2F8, 2E8	IRQ3	2F8

## 2.5.9 USB Connector (CN9)

The PCI-6870 board provides two USB (Universal Serial Bus) interfaces, which give complete plug and play and also hot attach/detach for up to 127 external devices. The USB interfaces comply with USB specification rev. 1.0 and are fuse protected.

The USB interfaces are accessed through a 10-pin flat-cable connector, CN9. The adapter cable has a 10-pin connector on one end and a USB connector on the bracket.

The USB interfaces can be disabled in the system BIOS setup.

## 2.5.10 EBX Power Connector (CN11)

If you prefer not to acquire power through PCI-6870's backplane via the gold H-connectors, CN11 also provides power input connectors for +5 V and +12 V. (see Appendix C)

### **2.5.11 CPU Fan Power Supply Connector (CN12)**

This provides power supply to the optional CPU cooling fan. This connector is only available when +12 V power is supplied to the board.

**Warning!** *Before making the connection, make sure the voltage is absolutely correct and matched with the correct connector.*

### **2.5.12 ATX power button (CN13)**

The PCI-6870 provides an ATX power input connector. When connected with the ATX power switch, the ATX power switch connector (CN13) enables power On/Off from the chassis.

### **2.5.13 Primary EIDE Connector (CN15)**

You can attach four IDE (Integrated Device Electronics) drives to the PCI-6870's internal controller. The PCI-6870 CPU card has an EIDE connector, CN15.

Wire number 1 on the cable is red or blue, and the other wires are gray. Connect one end to connector CN15 on the CPU card. Make sure that the red (or blue) wire corresponds to pin 1 on the connector (on the right side). See Chapter 1 for help in finding the connector.

Unlike floppy drives, IDE hard drives can connect in either position on the cable. If you install two drives, you will need to set one as the master and one as the slave. You do this by setting the jumpers on the drives. If you use just one drive, you should set it as the master. See the documentation that came with your drive for more information.

Connect the first hard drive to the other end of the cable. Wire 1 on the cable should also connect to pin 1 on the hard drive connector, which is labeled on the drive circuit board. Check the documentation that came with the drive for more information.

Connect the second drive, as described above, on CN15.

### **2.5.14 Serial IRQ (CN16)**

This connector has two pins. Pin1 is CON\_SERIRQ, and Pin2 is GND.

### **2.5.15 Audio connector (CN17)**

The PCI-6870 CPU card supports AC97 with the help of an optional cable connected to CN17. The optional audio cable is P/N 1700160160.

### **2.5.16 Secondary EIDE connector (CN18)**

The secondary channel supports UDMA/33 only.

#### **Connecting the hard drive**

Connecting drives is done in a daisy-chain fashion. It requires one of two cables (not included in this package), depending on the drive size. 1.8" and 2.5" drives need a 1 x 44-pin to 2 x 44-pin flat-cable connector. 3.5" drives use a 1 x 44-pin to 2 x 40-pin connector.

Wire number 1 on the cable is red or blue, and the other wires are gray.

Connect one end of the cable to CN18. Make sure that the red (or blue) wire corresponds to pin 1 on the connector, which is labeled on the board (on the right side).

Plug the other end of the cable into the Enhanced IDE hard drive, with pin 1 on the cable corresponding to pin 1 on the hard drive. (See your hard drive's documentation for the location of the connector.)

If desired, connect a second drive as described above.

Unlike floppy drives, IDE hard drives can connect to either end of the cable. If you install two drives, you will need to set one as the master and one as the slave by using jumpers on the drives. If you install only one drive, set it as the master.

### **2.5.17 Floppy Drive Connector (CN20)**

You can attach up to two floppy disk drives to the PCI-6870's on-board controller. You can use any combination of 5.25" (360 KB/1.2 MB) and/or 3.5" (720 KB/1.44/2.88 MB) drives.

The card uses a Hirose 20 connector (DF13-20DP-1.25V).

### **2.5.18 CompactFlash Disk (SK1)**

The PCI-6870 is equipped with a CompactFlash™ disk socket on the solder side that supports the IDE interface for CompactFlash cards. The on-board CompactFlash socket is designed to prevent incorrect installation. Be sure that the system power is off when installing and removing CompactFlash™ cards.

The CompactFlash card is defaulted as the Secondary channel slave drive on your PC system.

## 2.6 Adding System Memory (DIMM)

---

You can install anywhere from 8 to 512 MB of SDRAM into your PCI-6870 series card. The card is provided with a 168-pin DIMM socket, which accepts 32, 64, 128, 256, or 512 MB 3.3 V power level DIMMs.

*Note: The PCI-6870 card only supports SDRAM DIMM modules. EDO DIMM is not supported.*

### 2.6.1 Installing DIMMs

*Note: The modules can only fit into the socket one way. Their gold pins must point down into the DIMM socket.*

The procedure for installing DIMMs appears below. Please follow these steps carefully.

1. Ensure that all power supplies to the system are switched Off.
2. Install the DIMM card. Install the DIMM so that its gold pins point down into the DIMM socket.
3. Slip the DIMM into the socket at a 45 degree angle and carefully fit the bottom of the card against the connectors.
4. Gently push the DIMM into a perpendicular position until the clips on the ends of the DIMM sockets snap into place.
5. Check to ensure that the DIMM is correctly seated and all connector contacts touch. The DIMM should not move around in its socket.

## 2.7 CPU installation and upgrading

---

1. If you are upgrading the CPU, remove the old CPU from the socket. If it is difficult to remove, you may find chip lubricant (designed for pin-grid-array devices, PGAs) and a chip puller helpful. Both are available at electronics hobby supply stores.
2. Plug the new CPU into the empty socket. Follow the instructions that came with the CPU or math coprocessor. If you have no instructions, do the following: Lubricate the CPU pins with lubricant made for PGA devices. This will make the new CPU slide in much more easily, and reduce the chance of damaging it. Next, carefully align the CPU so that it is parallel to the socket and the notch on the corner of the CPU corresponds with the notch on the inside of the socket. Gently slide the CPU in. There will probably be a gap between the CPU and the connector when it is fully seated - do not push too hard!

# CHAPTER 3

## Award BIOS Setup

This chapter describes how to set the card's BIOS configuration data.

# 3.1 AWARD BIOS Setup

The Award BIOS ROM has a built-in Setup program that allows users to modify the basic system configuration. This type of information is stored in battery-backed RAM so that it retains the Setup information when the power is turned off.

## 3.1.1 Entering setup

Turn on the computer and immediately press <DEL>. This will allow you to enter Setup.

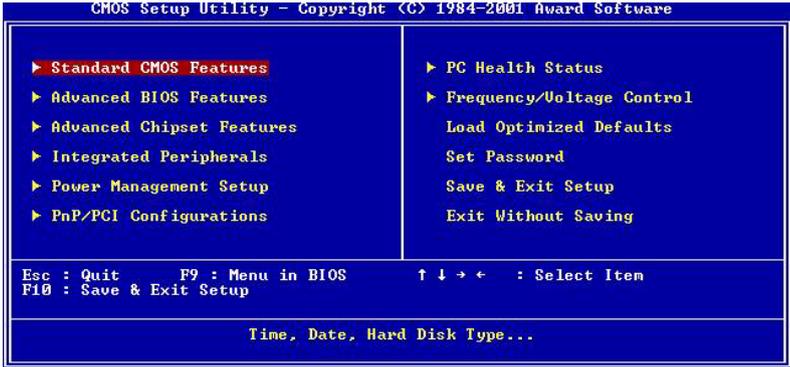


Figure 3-1: Setup program initial screen

### 3.1.2 Standard CMOS setup

Choose the “STANDARD CMOS SETUP” option from the INITIAL SETUP SCREEN Menu, and the screen below is displayed. This standard Setup Menu allows users to configure system components such as date, time, hard disk drive, floppy drive, display, and memory.

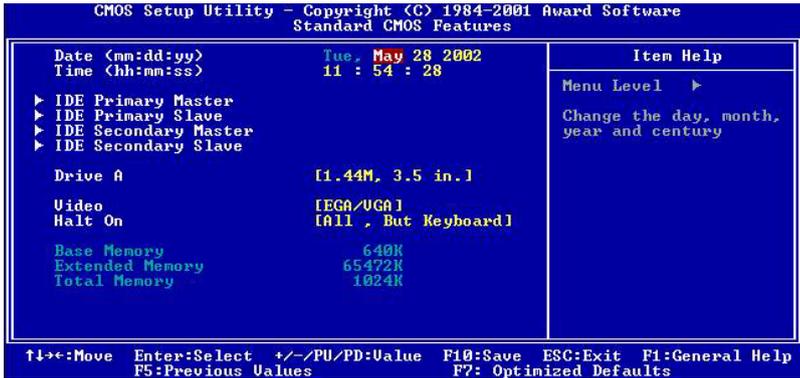


Figure 3-2: CMOS setup screen

### 3.1.3 Advanced BIOS Features

The ADVANCED BIOS FEATURES is a submenu from the initial BIOS setup screen. It allows the user to configure the PCI-6870 according to his particular requirements.

Below are some major items that are provided in the ADVANCED BIOS FEATURES SETUP screen:



Figure 3-3: Advanced BIOS Features setup screen

#### Virus Warning

During and after the system boots up, any attempt to write to the boot sector or partition table of the hard disk drive will halt the system. In this case, a warning message will be displayed. You can run the anti-virus program to locate the problem.

If Virus Warning is Disabled, no warning message will appear if anything attempts to access the boot sector or hard disk partition.

#### CPU Internal Cache/External Cache

Depending on the CPU/chipset design, these options can speed up memory access when enabled.

### Quick Power On Self Test

This option speeds up the Power-On Self Test (POST) conducted as soon as the computer is turned on. When enabled, BIOS shortens or skips some of the items during the test. When disabled, normal POST procedures assumes.

### Boot Sequence

This function determines the sequence in which the computer will search the drives for the disk operating system (i.e. DOS). The default value is “C, A”.

A, C	System will first search the FDD, then the HDD.
C, A	System will first search the HDD, then the FDD.
C only	System will only search the HDD.
•	•
•	•
•	•

### Boot Up Floppy Seek

During POST, BIOS will determine if the floppy disk drive installed is 40 or 80 tracks. 360 KB type is 40 tracks while 720 KB, 1.2 MB, and 1.44 MB are all 80 tracks.

---

Enabled	BIOS searches the floppy drive to determine if it is 40 or 80 tracks. Note that BIOS cannot differentiate 720 KB, 1.2 MB, and 1.44 MB type drives as they are all 80 tracks.
---------	--

---

Disabled	BIOS will not search for the floppy drive type by track number. Note that there will not be any warning message if the drive installed is 360 KB.
----------	---

---

### Boot Up NumLock Status

The default is “On”.

---

On	Keypad boots up to number keys.
----	---------------------------------

---

Off	Keypad boots up to arrow keys.
-----	--------------------------------

---

## Boot Up System Speed

---

High	Sets the speed to high
Low	Sets the speed to low

---

## IDE HDD Block Mode

---

Enabled	Enable IDE HDD Block Mode. BIOS will detect the block size of the HDD and send a block command automatically.
Disabled	Disable IDE HDD Block Mode

---

## Gate A20 option

---

Normal	The A20 signal is controlled by the keyboard controller or chipset hardware
Fast	Default: Fast. The A20 signal is controlled by Port 92 or chipset specific method.

---

## Typematic Rate Setting

The typematic rate determines the characters per second accepted by the computer. Typematic Rate setting enables or disables the typematic rate.

### Typematic Rate (Char/Sec)

BIOS accepts the following input values (character/second) for Typematic Rate: 6, 8, 10, 12, 15, 20, 24, 30.

### Typematic Delay (msec)

When holding down a key, the Typematic Delay is the time interval between the appearance of the first and second characters. The input values (msec) for this category are: 250, 500, 750, 1000.

## Security Option

This setting determines whether the system will boot if the password is denied, while limiting access to Setup.

---

<b>System</b>	The system will not boot, and access to Setup will be denied if the correct password is not entered at the prompt.
---------------	--

---

<b>Setup</b>	The system will boot, but access to Setup will be denied if the correct password is not entered at the prompt.
--------------	--

---

Note: To disable security, select **PASSWORD SETTING** in the main menu. At this point, you will be asked to enter a password. Simply hit the <ENTER> key to disable security. When security is disabled, the system will boot, and you can enter Setup freely.

#### **OS Select for DRAM>64 MB**

This setting is under OS/2 system.

#### **Video BIOS Shadow**

This determines whether video BIOS will be copied to RAM, which is optional according to the chipset design. When enabled, Video Shadow increases the video speed.

#### **C8000 - CFFFF Shadow/DC000-DFFFF Shadow**

These determine whether optional ROM will be copied to RAM in blocks of 16 KB.

---

Enabled	Optional shadow is enabled
---------	----------------------------

---

Disabled	Optional shadow is disabled
----------	-----------------------------

---

### 3.1.4 Advanced Chipset Features

By choosing the “ADVANCED CHIPSET FEATURES” option from the INITIAL SETUP SCREEN Menu, the screen below is displayed. This sample screen contains the manufacturer’s default values for the PCI-6870.

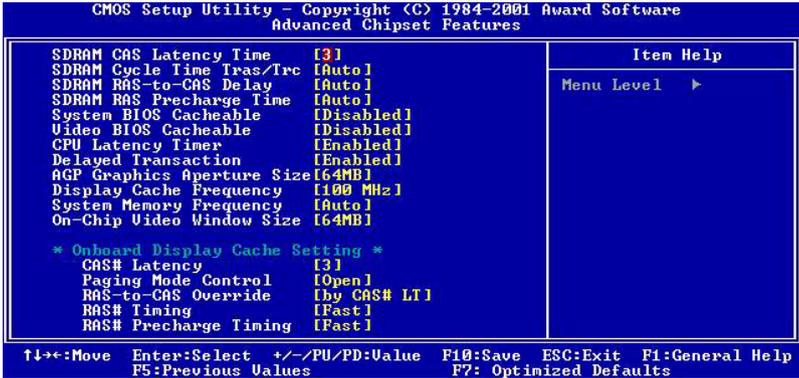


Figure 3-4: Advanced Chipset Features screen

### 3.1.5 Integrated Peripherals

Choosing the Integrated Peripherals option from the Initial Setup Screen menu should produce the screen below. Here we see the manufacturer's default values for the PCI-6870 Series.



Figure 3-5: Integrated Peripherals

### 3.1.6 Power management setup

The power management setup controls the CPU cards' "green" features. The following screen shows the manufacturer's defaults.

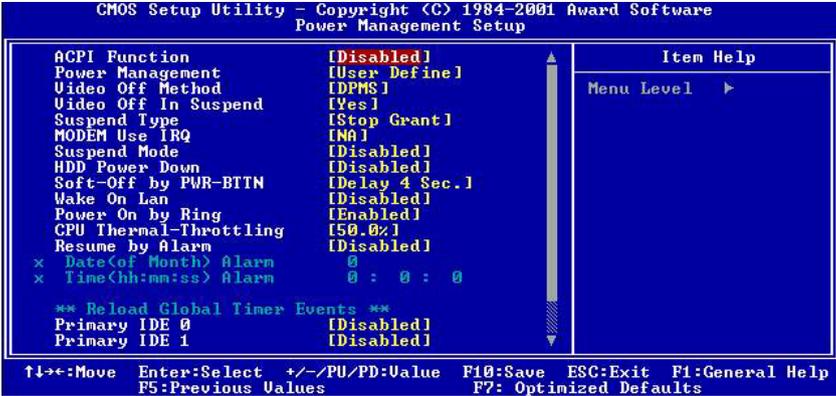


Figure 3-6: Power management setup screen

#### Power Management

This option allows you to determine if the values in power management are disabled, user-defined, or predefined.

#### HDD Power Management

You can choose to turn the HDD off after one of the time intervals listed, or when the system is in Suspend mode. If in a power saving mode, any access to the HDD will wake it up.

*Note:* The HDD will not power down if the Power Management option is disabled.

#### IRQ Activity

IRQ can be set independently. Activity on any enabled IRQ will wake up the system.

### 3.1.7 PnP PCI configuration setup

By choosing the PnP/PCI Configurations option from the Initial Setup Screen menu, the screen below is displayed. This sample screen contains the manufacturer's default values for the PCI-6870 Series.

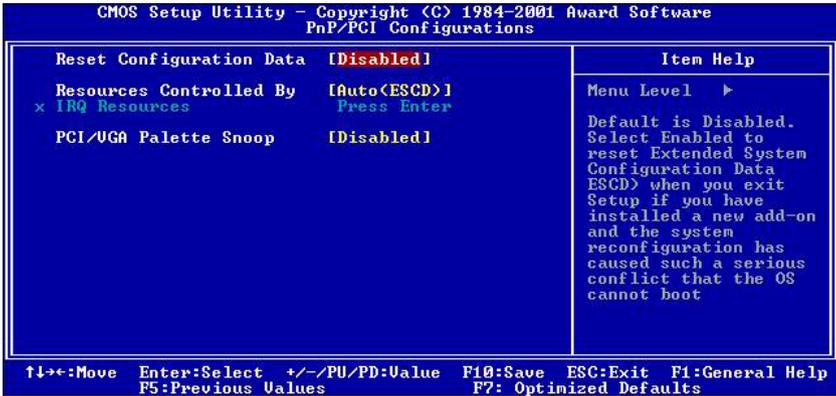


Figure 3-7: PCI configuration screen

### 3.1.8 PC Health Status

The PC Health Status screen looks like this. It displays information such as CPU and motherboard temperatures, fan speeds, and core voltage.

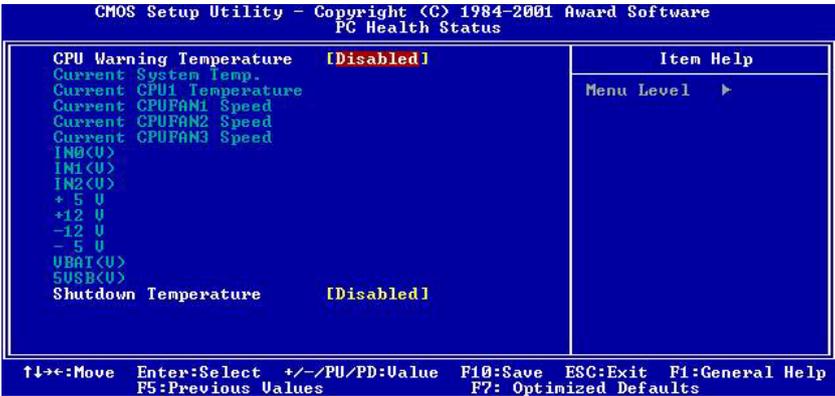
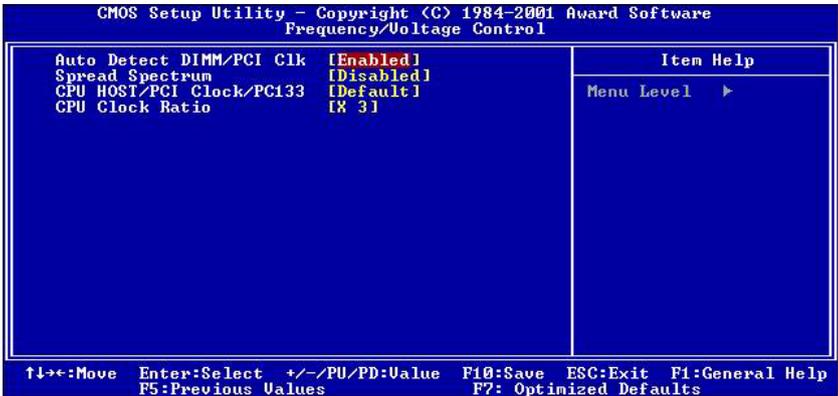


Figure 3-8: PC Health Status

### 3.1.9 Frequency/Voltage Control

By choosing the Frequency/Voltage Control option from the Initial Setup Screen menu, the screen below is displayed. This sample screen contains the manufacturer's default values for the PCI-6870.



**Figure 3-9: Frequency/Voltage Control**

**Caution** *Incorrect settings in Frequency/Voltage Control may damage the system CPU, video adapter, or other hardware.*

### **3.1.10 Load Optimized Defaults**

Load Optimized Defaults loads the default system values directly from ROM. If the stored record created by the Setup program should ever become corrupted (and therefore unusable), these defaults will load automatically when you turn the PCI-6870 Series system on.

### **3.1.11 Set Password**

To establish, change, or disable the password, choose the “SET PASSWORD” option from the Setup main menu and press [Enter]. The password can be at most 8 characters long.

Remember, to enable this feature, you must first select the Security Option in the Advanced BIOS Features Setup to be either “Setup” or “System.”

#### **To Establish Password**

Choose the Set Password option from the CMOS Setup Utility main menu and press <Enter>.

When you see “Enter Password,” enter the desired password and press <Enter>.

At the “Confirm Password” prompt, retype the desired password, then press <Enter>.

Select Save to CMOS and EXIT, type <Y>, then <Enter>.

#### **To Change Password**

Choose the Set Password option from the CMOS Setup Utility main menu and press <Enter>.

When you see “Enter Password,” enter the existing password and press <Enter>.

You will see “Confirm Password.” Type it again, and press <Enter>.

Select Set Password again, and at the “Enter Password” prompt, enter the new password and press <Enter>.

At the “Confirm Password” prompt, retype the new password, and press <Enter>.

Select Save to CMOS and EXIT, type <Y>, then <Enter>.

### **To Disable Password**

Choose the Set Password option from the CMOS Setup Utility main menu and press <Enter>.

When you see “Enter Password,” enter the existing password and press <Enter>.

You will see “Confirm Password.” Type it again, and press <Enter>.

Select Set Password again, and at the “Enter Password” prompt, don’t enter anything; just press <Enter>.

At the “Confirm Password” prompt, again don’t type in anything; just press <Enter>.

Select Save & Exit Setup, type <Y>, then <Enter>.

### **3.1.12 Save & Exit Setup**

If you select this, type <Y>, and press the [Enter] key, the values entered in the setup utilities will be recorded in the CMOS memory of the chipset. The microprocessor will check this every time you turn your system on and compare this to what it finds as it checks the system. This record is required for the system to operate.

### **3.1.13 Exit Without Saving**

Selecting this option and pressing the [Enter] key lets you exit the Setup program without recording any new values or changing old ones.



## AGP SVGA Setup

- Introduction
- Installation of SVGA driver for
  - Windows 98 and 2000
  - Windows NT

## 4.1 Introduction

---

The PCI-6870 has an on-board AGP flat panel/VGA interface. The specifications and features are described as follows:

### 4.1.1 Chipset

The PCI-6870 makes use of the display properties of the Intel 815E AGP/SVGA controller. It supports interlaced and non-interlaced analog monitors (color and monochrome VGA) in high-resolution modes while maintaining complete IBM VGA compatibility. Digital monitors (i.e. MDA, CGA, and EGA) are NOT supported. Multiple frequency (multisync) monitors are handled as if they were analog monitors.

### 4.1.2 Display types

CRT and panel displays can be used simultaneously. The PCI-6870 can be set in one of three configurations: on a CRT, on a flat panel display, or on both simultaneously. The system is initially set to simultaneous display mode. The BIOS setup can be used to configure the display. In BIOS, select “Integrated Peripherals”, then “Boot-up display type.” You can then choose one of the following modes: “CRT only”, “Panel only”, or “Simultaneous.”

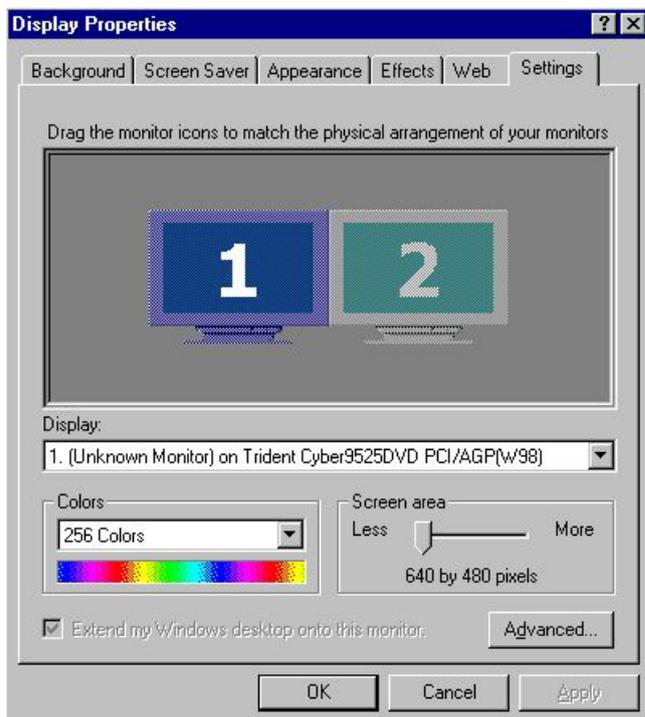
### 4.1.3 Dual/simultaneous display

The PCI-6870 uses the Intel 815e controller that is capable of providing multiple views and simultaneous display with mixed video and graphics on a flat panel and CRT.

To set up dual display under Windows 98, follow these steps:

1. Select “Windows98”, “Control panel”, “Display”, “Settings”.
2. Select “1” for current display, or “2” for second display.
3. Enable “Extend my Windows desktop onto this monitor”.

4. Click “OK”.



*Figure 4-1: Selecting display settings*

## 4.2 Installation of SVGA driver

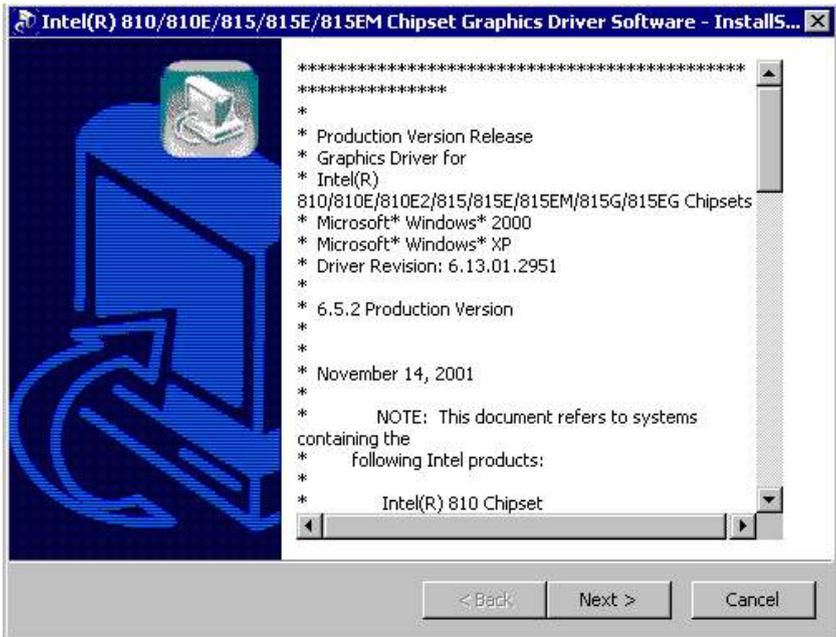
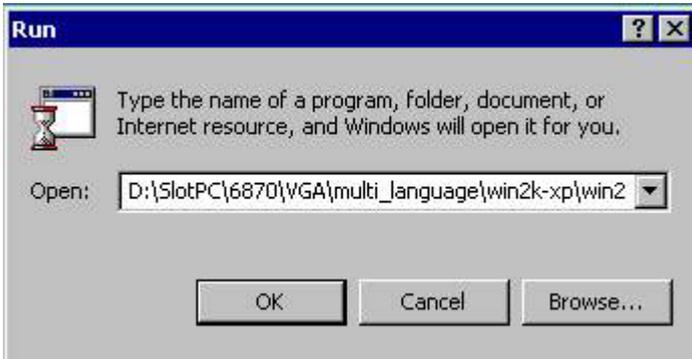
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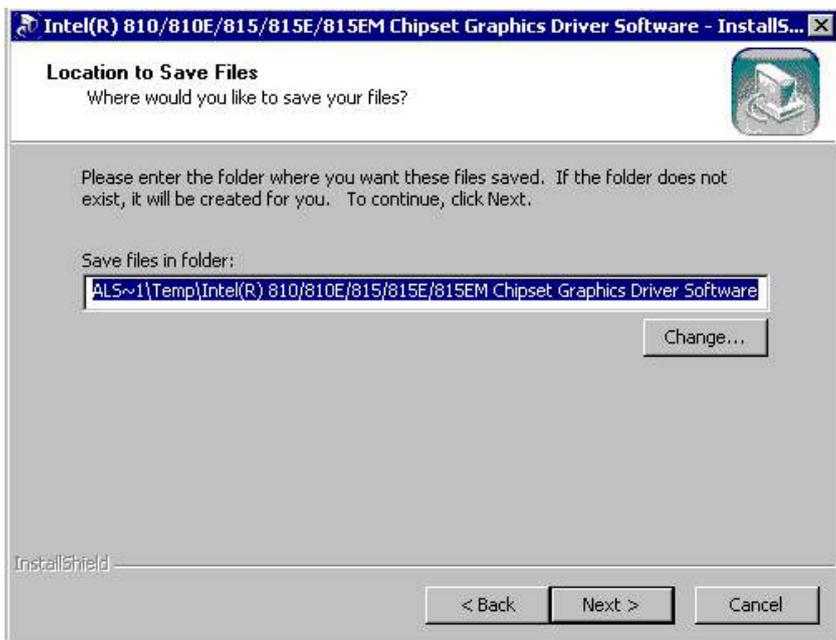
Complete the following steps to install the SVGA driver. Follow the procedures that apply to the operating system that you are using within your PCI-6870.

*Important: The following windows illustrations are examples only. You must follow the instructions which appear on your screen.*

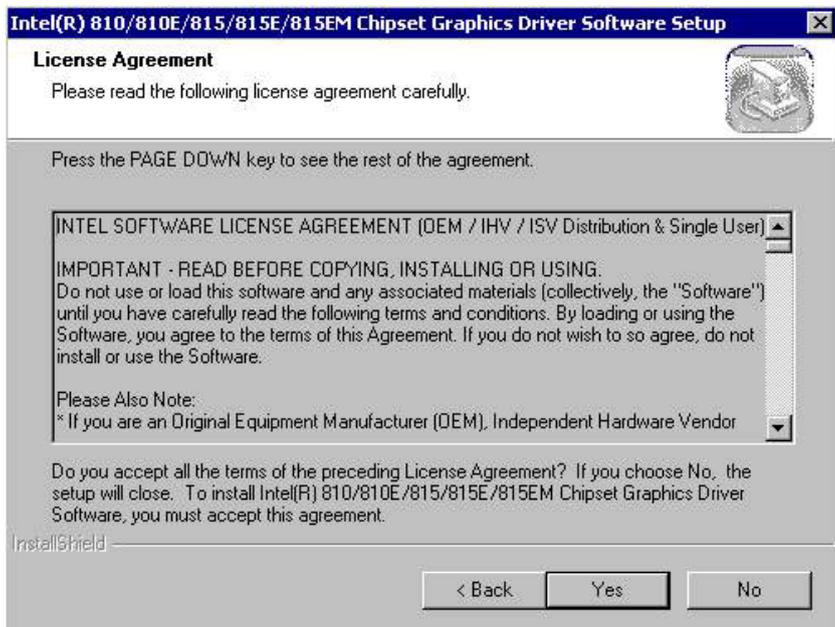
## 4.2.1 Installation for Windows 98 and 2000

Insert the disk, or otherwise make the files available to the system, and run setup. Then proceed as directed by the prompts.









## Intel(R) 810/810E/815/815E/815EM Chipset Graphics Driver Software Setup



### InstallShield(R) Wizard Complete

The InstallShield(R) Wizard has successfully installed Intel(R) 810/810E/815/815E/815EM Chipset Graphics Driver Software. Before you can use the program, you must restart your computer.

- Yes, I want to restart my computer now.
- No, I will restart my computer later.

Remove any disks from their drives, and then click Finish to complete setup.

< Back

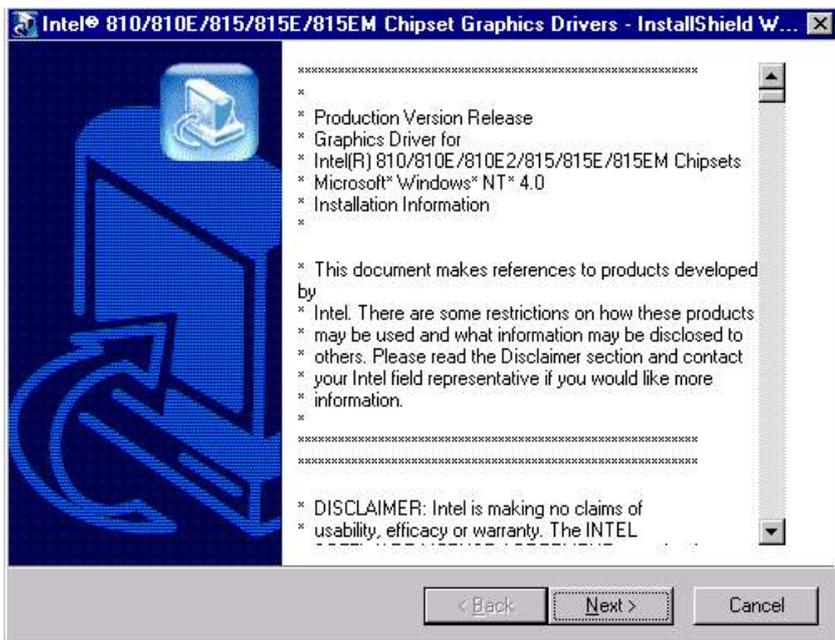
Finish

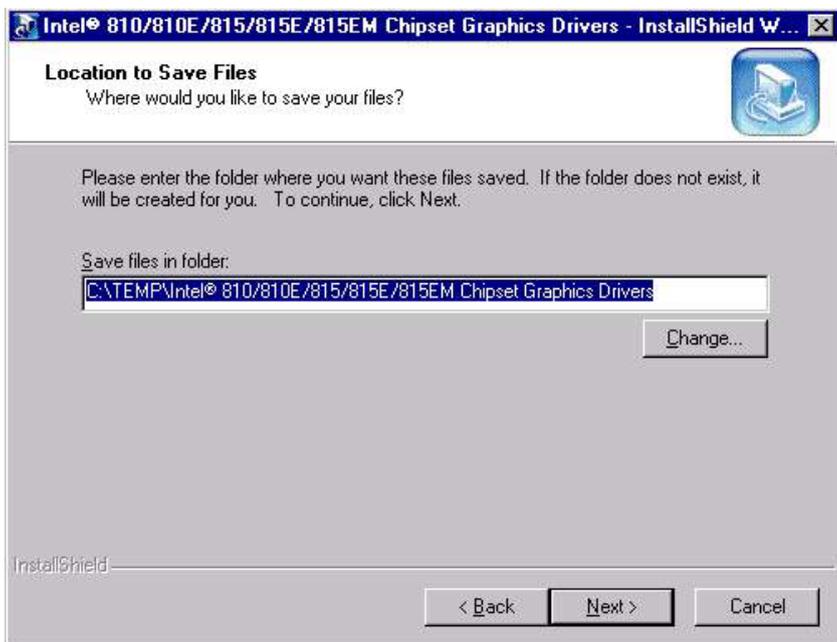
Cancel >

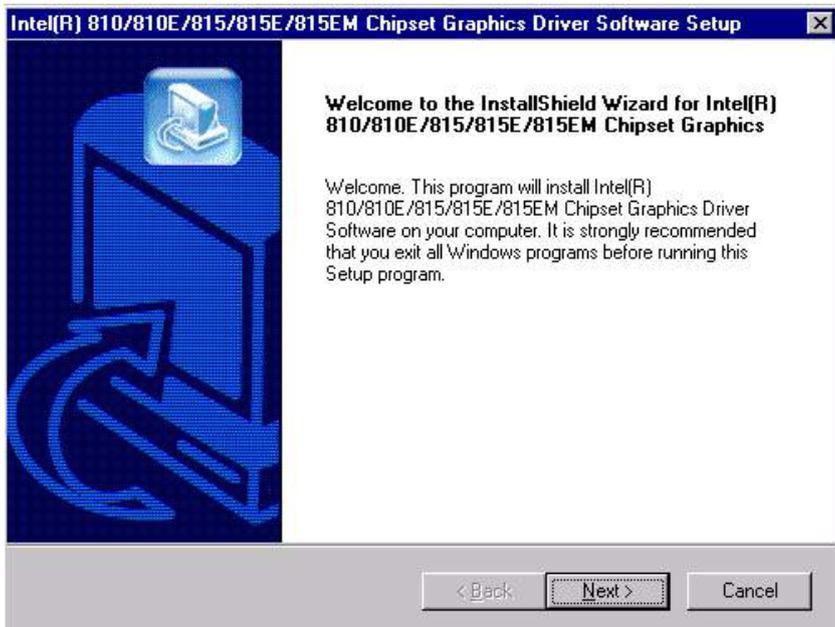
## 4.2.2 Installation for Windows NT

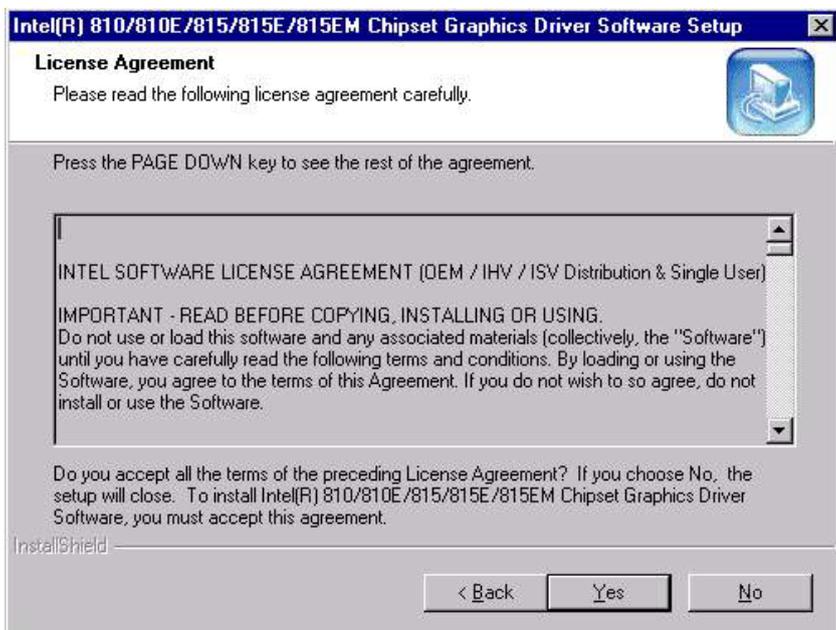
Insert the disk, or otherwise make the files available to the system, and run setup. Then proceed as directed by the prompts.











### 4.3 Further information

---

For further information about the AGP/SVGA installation in your PCI-6870, including driver updates, troubleshooting guides and FAQ lists, visit the following web resources:

Trident website: [www.trid.com](http://www.trid.com)

Advantech websites: [www.advantech.com](http://www.advantech.com)  
[www.advantech.com.tw](http://www.advantech.com.tw)

## **PCI Bus Ethernet Interface**

This chapter provides information on Ethernet configuration.

- Introduction
- Installation of Ethernet driver for Windows 98 & 2000
- Installation of Ethernet driver for Windows NT
- Further information

## 5.1 Introduction

---

The PCI-6870 is equipped with a high performance Intel 82562ET 32-bit Ethernet chipset. This is a highly integrated Platform LAN Connect (ICH2/3/4) device combining 10BASE-T and 100BASE-TX physical layer capabilities. It is fully compliant with the IEEE 802.3/802.3u standard. The IEEE 802.3u standard for 100BASE-TX defines networking over two pairs of Category 5 unshielded twisted pair cable. The 82562ET complies with the IEEE 802.3u Auto-Negotiation (and 100BASE-TX) standard and the IEEE 802.3x Full-Duplex Flow Control standard.

The Ethernet port provides a standard RJ-45 jack on board. The network boot feature can be utilized by incorporating the boot ROM image files for the appropriate network operating system. The boot ROM BIOS files are combined with system BIOS, which can be enabled/disabled in the BIOS setup.

## 5.2 Installation of Ethernet driver

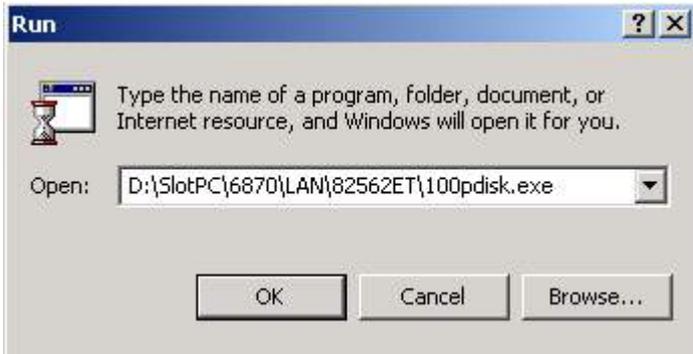
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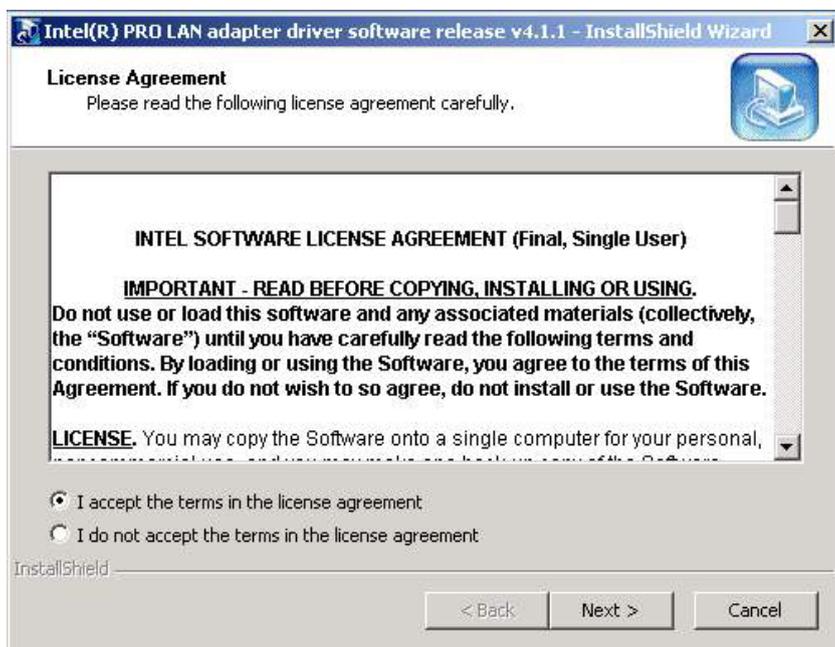
Before installing the Ethernet driver, note the procedures below. Select the operating system you are using in your PCI-6870, and then refer to the corresponding installation illustrations.

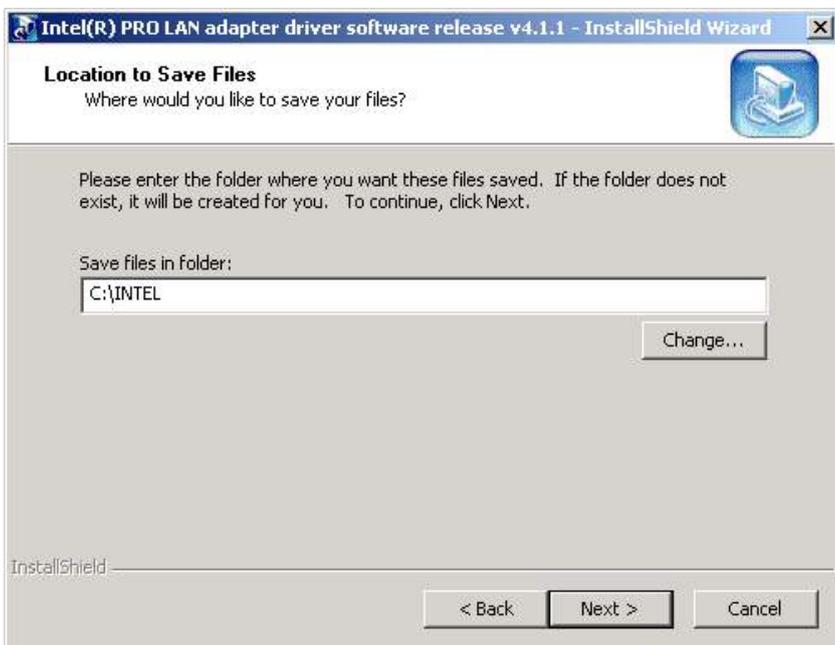
*Note:*        *The windows illustrations in this chapter are examples only. You must follow the instructions which appear on your screen.*

### 5.2.1 Installation for Windows 98 and 2000

Insert the disk, or otherwise make the files available to the system, and run the executable. Then proceed as directed by the prompts.











## Upgrade Device Driver Wizard

### Install Hardware Device Drivers

A device driver is a software program that enables a hardware device to work with an operating system.



This wizard upgrades drivers for the following hardware device:



Ethernet Controller

Upgrading to a newer version of a device driver may add functionality to or improve the performance of this device.

What do you want the wizard to do?

- Search for a suitable driver for my device (recommended)
- Display a list of the known drivers for this device so that I can choose a specific driver

< Back

Next >

Cancel

## Upgrade Device Driver Wizard

### Hardware Type

What type of hardware do you want to install?



Select a hardware type, and then click Next.

Hardware types:

-  IEEE 1394 Bus host controllers
-  Imaging devices
-  Infrared devices
-  Memory technology driver
-  Modems
-  Multi-port serial adapters
-  **Network adapters**
-  NT Apm/Legacy Support
-  Other devices

< Back

Next >

Cancel

## Upgrade Device Driver Wizard

### Select Network Adapter

Which network adapter do you want to install?



Click the Network Adapter that matches your hardware, then click OK. If you have an installation disk for this component, click Have Disk.

Manufacturers:



Network Adapter:

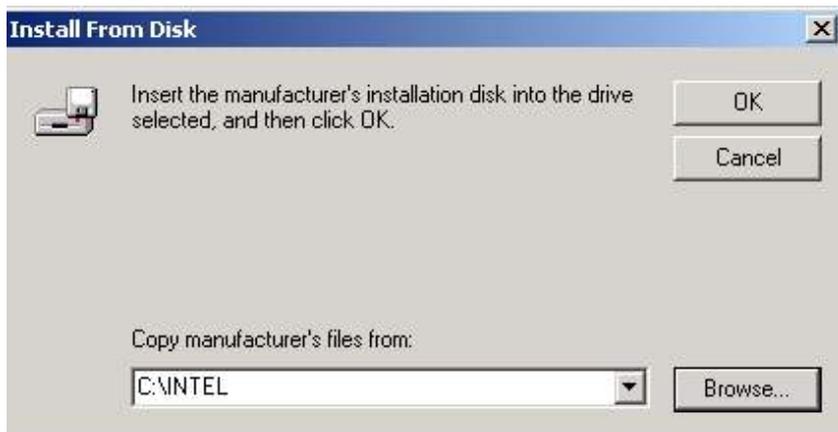


Have Disk...

< Back

Next >

Cancel



## Upgrade Device Driver Wizard

### Select Network Adapter

Which network adapter do you want to install?



Click the Network Adapter that matches your hardware, then click OK. If you have an installation disk for this component, click Have Disk.

Network Adapter:

Intel(R) PRO/100 VE Network Connection

- Show compatible hardware  
 Show all hardware of this device class

Have Disk...

< Back

Next >

Cancel

## Upgrade Device Driver Wizard

### Start Device Driver Installation

The device driver will be installed with the default settings.



The wizard is ready to install the driver for the following hardware device:



Intel(R) PRO/100 VE Network Connection

Windows will use default settings to install the software for this hardware device. To install the software for your new hardware, click Next.

< Back

Next >

Cancel

## Upgrade Device Driver Wizard



### Completing the Upgrade Device Driver Wizard



Intel(R) PRO/100 VE Network Connection

Windows has finished installing the software for this device.

To close this wizard, click Finish.

< Back

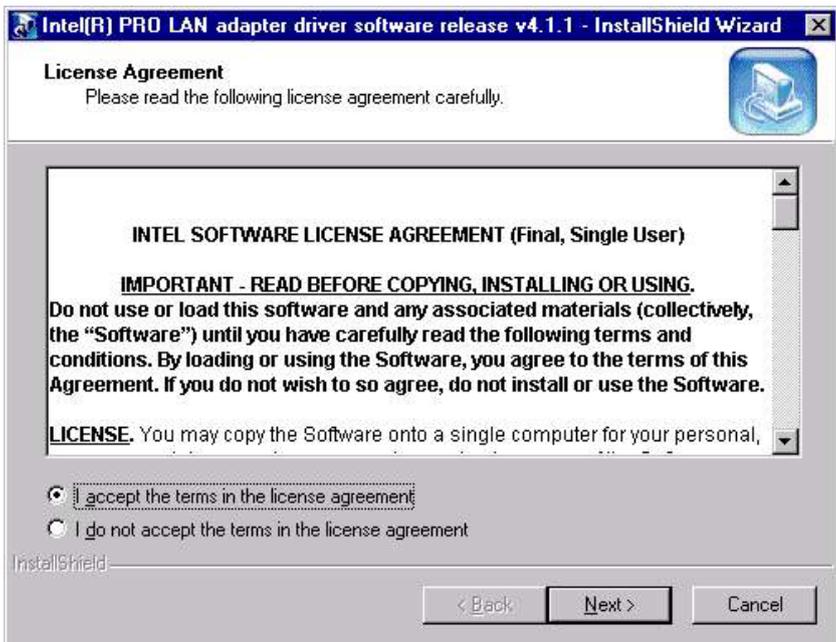
Finish

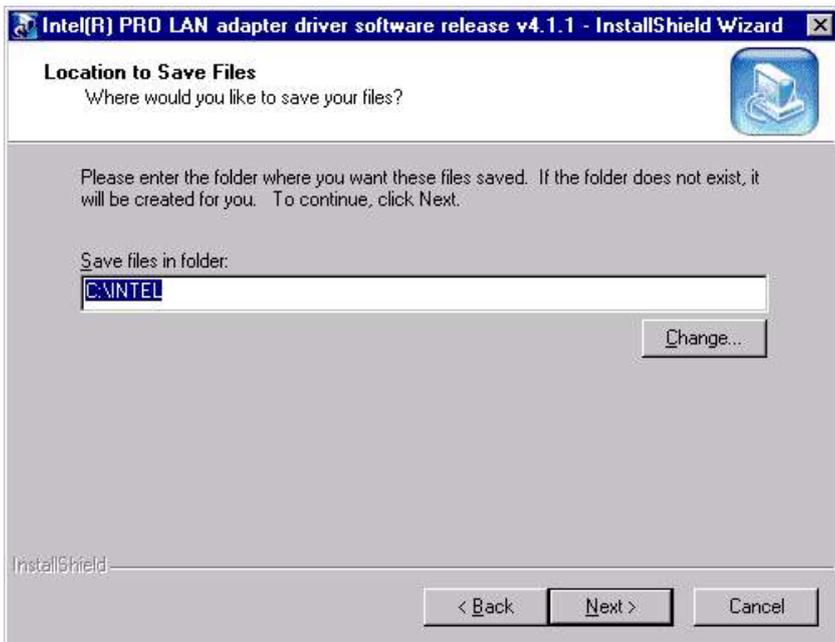
Cancel

## 5.2.2 Installation for Windows NT

Insert the disk, or otherwise make the files available to the system, and run the appropriate executable. Then proceed as directed by the prompts.

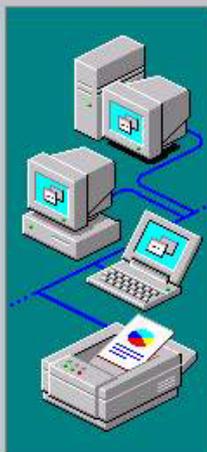








## Network Setup Wizard



Windows NT needs to know how this computer should participate on a network.



**Wired to the network:**

Your computer is connected to the network by an ISDN Adapter or Network Adapter.



**Remote access to the network:**

Your computer uses a Modem to remotely connect to the network.

< Back

Next >

Cancel

## Network Setup Wizard



To have setup start searching for a Network Adapter, click Start Search button.

Start Search

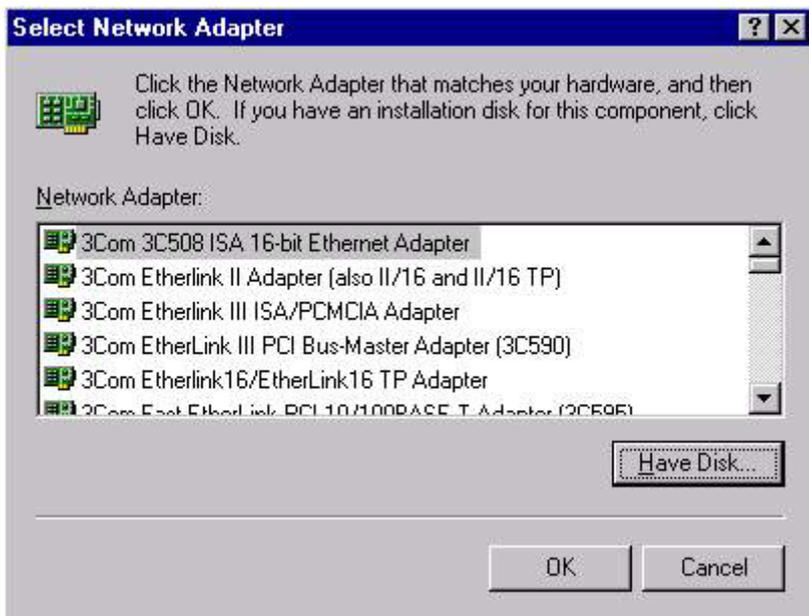
Network Aapters:

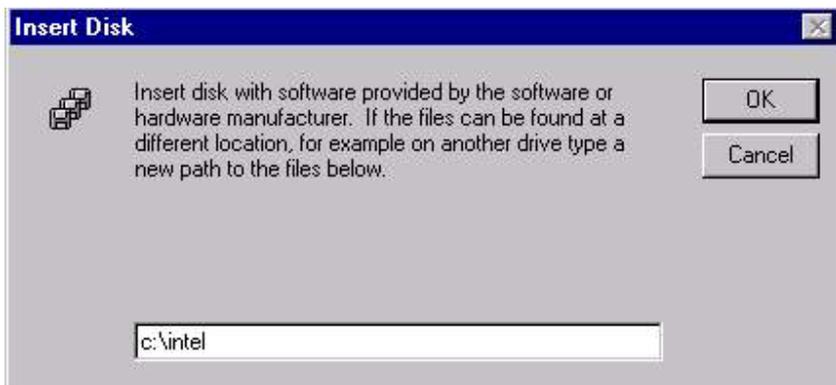
Select from list...

< Back

Next >

Cancel







## Network Setup Wizard



To have setup start searching for a Network Adapter, click Start Search button.

Start Search

Network Addapters:

Intel(R) PRO Adapter

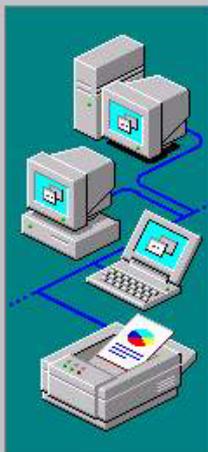
Select from list...

< Back

Next >

Cancel

## Network Setup Wizard



Select the networking protocols that are used on your network.  
If you are unsure, contact your system administrator.

Network Protocols:

- TCP/IP Protocol
- NwLink IPX/SPX Compatible Transport
- NetBEUI Protocol

Select from list...

< Back

Next >

Cancel

## Network Setup Wizard



Listed below are the services that will be installed by the system. You may add to this list by clicking the Select from list button.

### Network Services:

-  RPC Configuration
-  NetBIOS Interface
-  Workstation
-  Server

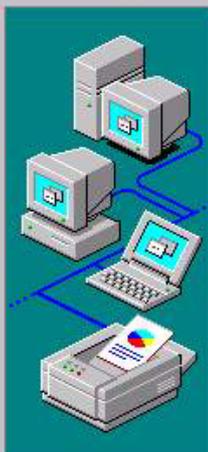
Select from list...

< Back

Next >

Cancel

## Network Setup Wizard



Windows NT is now ready to install networking components that you selected and others required by the system.

This process will allow individual components to install themselves and raise dialogs so that they may install correctly.

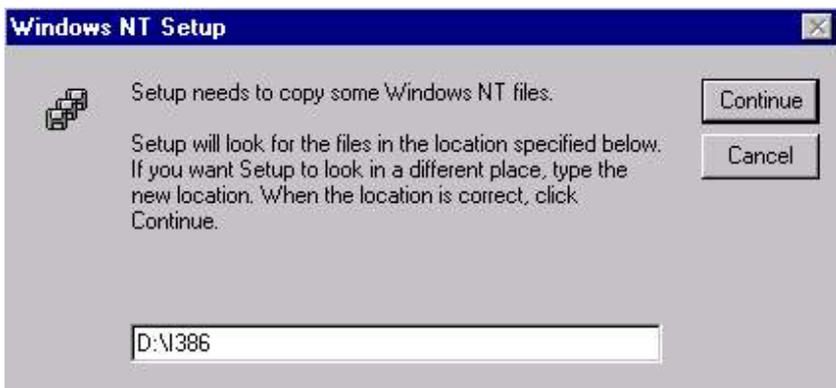
Click Next to install selected components.

Click Back to make changes to your selections.

< Back

Next >

Cancel





## 5.3 Further information

---

Intel website:

<http://www.intel.com/design/network/products/lan/controllers/82562.htm>

Advantech website: [www.advantech.com](http://www.advantech.com)

[www.advantech.com.tw](http://www.advantech.com.tw)

# CHAPTER 6

## Audio

- Introduction
- Installation of audio driver for Windows 98 and 2000
- Installation of audio driver for Windows NT

## 6.1 Introduction

---

The PCI-6870's on-board audio interface utilizes Realtek's ALC201 audio controller to provide two pairs of stereo outputs with independent volume controls, a mono output, and multiple stereo and mono inputs, along with flexible mixing, gain and mute functions.

The PCI-6870's on-board audio interface also supports the Plug and Play (PnP) standard and provides PnP configuration for audio, FM, and MPU-104 logical devices. It is compatible with AC97 version 2.0 voice and music functions. The ESFM synthesizer is registered compatible with the OPL3 and has extended capabilities. The PCI-6870 CPU card can support AC97 with the aid of an optional audio cable connected to CN17; this optional cable is P/N 1700160160.

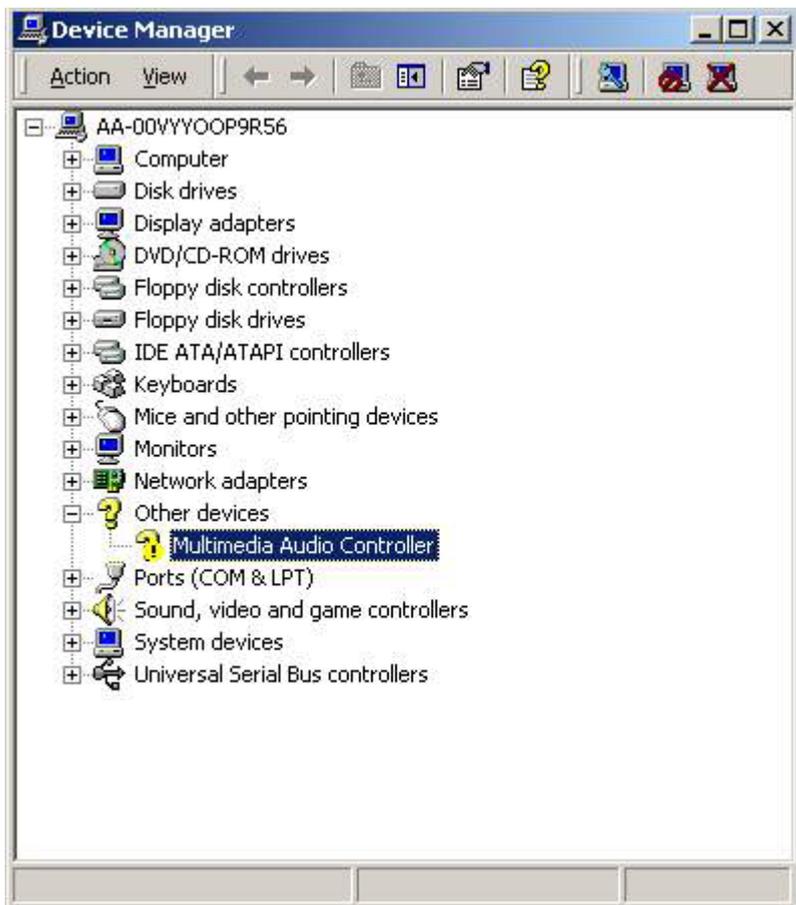
## 6.2 Installation of audio driver

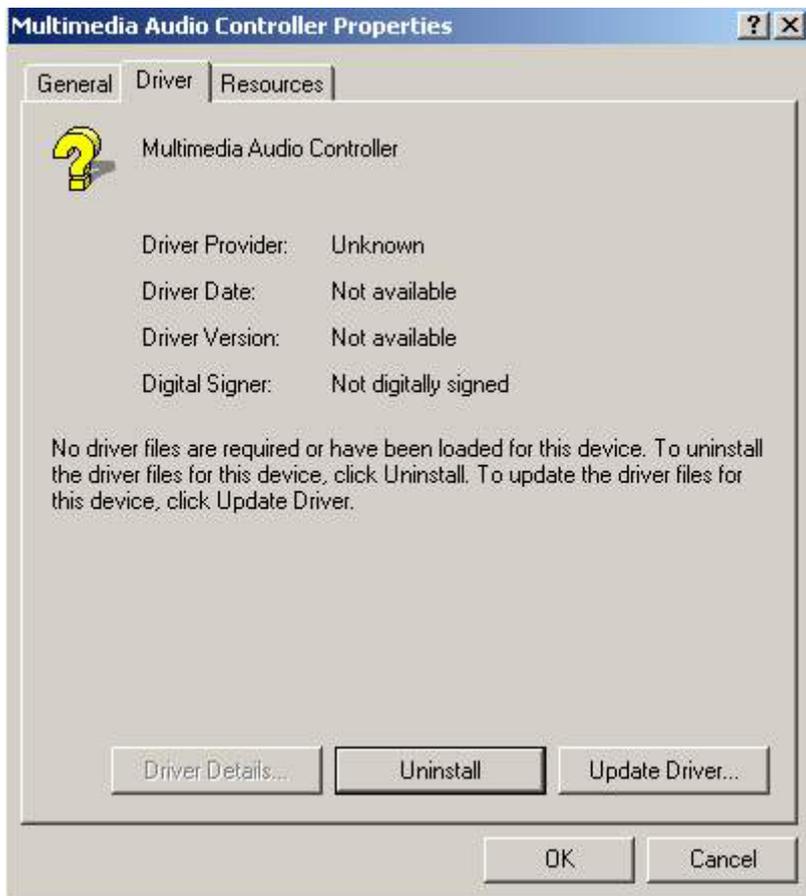
---

Before installing the audio driver, please take note of the procedures detailed below. You must know which operating system you are using in your PCI-6870's, and then refer to the corresponding installation flow chart. Just follow the steps in the flow chart. You can quickly and successfully complete the installation, even though you are not familiar with instructions for Windows.

*Note:*        *The CD-ROM drive is designated as "D" throughout this chapter.*

## 6.2.1 Installation for Windows 98 and 2000





## Upgrade Device Driver Wizard

### Hardware Type

What type of hardware do you want to install?



Select a hardware type, and then click Next.

Hardware types:

-  NT Apm/Legacy Support
-  Other devices
-  PCMCIA adapters
-  Ports (COM & LPT)
-  Printers
-  SCSI and RAID controllers
-  **Sound, video and game controllers**
-  System devices
-  Tape drives

< Back

Next >

Cancel

## Upgrade Device Driver Wizard

### Select a Device Driver

Which driver do you want to install for this device?



Select the manufacturer and model of your hardware device and then click Next. If you have a disk that contains the driver you want to install, click Have Disk...

Manufacturers:

- (Generic USB Audio)
- (Standard system devices)
- Altec Lansing
- Analog Devices
- ATI
- Aureal Semiconductor
- Avance Logic, Inc.

Models:

USB Audio Device

Have Disk...

< Back

Next >

Cancel



## Upgrade Device Driver Wizard

### Start Device Driver Installation

The device driver will be installed with the default settings.



The wizard is ready to install the driver for the following hardware device:



Avance AC'97 Audio for VIA (R) Audio Controller

Windows will use default settings to install the software for this hardware device. To install the software for your new hardware, click Next.

< Back

Next >

Cancel



## 6.2.2 Installation for Windows NT





Avance AC'97 Audio Setup [4.62]



**InstallShield Wizard Complete**

Setup has finished installing Avance AC'97 Audio on your computer.

- Yes, I want to restart my computer now.
- No, I will restart my computer later.

Remove any disks from their drives, and then click Finish to complete setup.

< Back

Finish

Cancel

# APPENDIX **A**

## **Programming the Watchdog Timer**

The PCI-6870 is equipped with a watchdog timer that resets the CPU or generates an interrupt if processing comes to a standstill for any reason. This feature ensures system reliability in industrial standalone or unmanned environments.

## A.1 Programming the Watchdog Timer

---

To program the watchdog timer, you must write a program which writes I/O port address 443 (hex). The output data is a value of time interval. The value range is from 01 (hex) to 3E (hex), and the related time interval is 1 sec. to 62 sec.

<b>Data</b>	<b>Time Interval</b>
01	1 sec.
02	2 sec.
03	3 sec.
04	4 sec.
•	•
•	•
•	•
3E	62 sec.

After data entry, your program must refresh the watchdog timer by rewriting the I/O port 443 (hex) while simultaneously setting it. When you want to disable the watchdog timer, your program should read I/O port 443 (hex).

The following example shows how you might program the watchdog timer in BASIC:

```
10      REM  Watchdog timer example program
20      OUT &H443, data REM  Start and restart the watchdog
30      GOSUB 1000 REM  Your application task #1,
40      OUT &H443, data REM  Reset the timer
50      GOSUB 2000 REM  Your application task #2,
60      OUT &H443, data REM  Reset the timer
70      X=INP (&H443) REM, Disable the watchdog timer
80      END

1000    REM  Subroutine #1, your application task
.      .
.      .
.      .
1070    RETURN

2000    REM  Subroutine #2, your application task
.      .
.      .
.      .
2090    RETURN
```



# APPENDIX **B**

## **Filler**

This appendix is supplied so that we can use the old Appendixes C and D, which are perfectly good, without changing all the references to them that appear in the text. We didn't want anyone to think that we *forgot* Appendix B.

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# APPENDIX **C**

## **Pin Assignments**

This appendix contains information of a detailed or specialized nature. It includes:

- CRT display connector
- RS-232/422/485 serial port connector
- Keyboard and mouse connector
- External keyboard connector
- Main power connectors (AT/ATX)
- IDE connector
- RS-232 serial port connector
- Ethernet RJ-45 connector
- Floppy connector
- Parallel connector
- IR connector
- HDD LED connector
- CompactFlash card connector

# C.1 CompactFlash Card Connector (SK1)

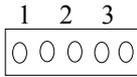
Table C-1: CompactFlash card connector

Pin	Signal	Pin	Signal
1	GND	2	D03
3	D04	4	D05
5	D06	6	D07
7	* CS0	8	A10 <sup>2</sup>
9	* ATA SEL	10	A09 <sup>2</sup>
11	A08 <sup>2</sup>	12	A07 <sup>2</sup>
13	+5 V	14	A06 <sup>2</sup>
15	A05 <sup>2</sup>	16	A04 <sup>2</sup>
17	A03 <sup>2</sup>	18	A02
19	A01	20	A00
21	D00	22	D01
23	D02	24	* IOCS16
25	* CD2	26	* CD1
27	D11 <sup>1</sup>	28	D12 <sup>1</sup>
29	D13 <sup>1</sup>	30	D14 <sup>1</sup>
31	D15 <sup>1</sup>	32	* CS1 <sup>1</sup>
33	* VS1	34	* IORD
35	* IOWR	36	* WE <sup>3</sup>
37	INTRQ	38	+5 V
39	* CSEL	40	* VS2
41	* RESER	42	IORDY
43	* INPACK	44	* REG <sup>3</sup>
45	* DASP	46	* PDIAG
47	D08 <sup>1</sup>	48	D09 <sup>1</sup>
49	D10	50	GND

\* low active

## C.2 IR Connector (CN1)

---



---

Table C-2: IR connector

---

<b>Pin</b>	<b>Signal</b>
1	+5 V
2	CIRRX
3	IRRX
4	GND
5	IRTX

---

### C.3 VGA Display Connector (CN2)

---

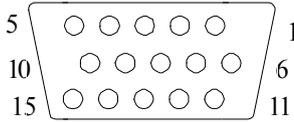
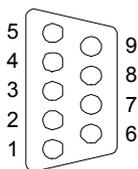


Table C-3: CRT display connector

Pin	Signal	Pin	Signal
1	RED	9	N/C
2	GREEN	10	GND
3	BLUE	11	N/C
4	N/C	12	N/C
5	GND	13	H-SYNC
6	GND	14	V-SYNC
7	GND	15	N/C
8	GND		

## C.4 COM1 RS-232 Serial Port (CN3)

---



---

Table C-4: COM1 RS-232 serial port

---

Pin	Signal
1	DCD
2	SIN
3	SOUT
4	DTR
5	GND
6	DSR
7	RTS
8	CTS
9	RI

---

# C.5 Keyboard and Mouse Connector (CN4)

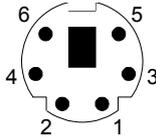
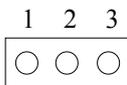


Table C-5: Keyboard and mouse connector

Pin	Signal
1	KBCLK
2	KBDATA
3	MSCLK signal
4	GND
5	+5V
6	MSDATA signal

## C.6 ATX Power Connector (CN6)

---



---

Table C-6: ATX power connector

---

<b>Pin</b>	<b>Signal</b>
1	5 V SB
2	GND
3	PS_ON

---

# C.7 Printer Port Connector (CN7)

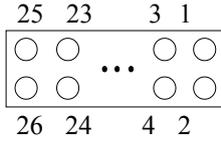


Table C-7: Parallel port connector

Pin	Signal
1	* STROBE
2	* AUTOFD
3	D0
4	ERR
5	D1
6	* INIT
7	D2
8	* SLCTINI
9	D3
10	GND
11	D4
12	GND
13	D5
14	GND
15	D6
16	GND
17	D7
18	GND
19	*ACK
20	GND
21	BUSY
22	GND
23	PE
24	GND
25	SLCT
26	GND

\* low active

## C.8 COM2 RS-422/485 Serial Port (CN8)

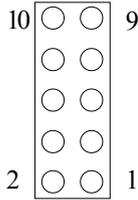


Table C-8: COM2 RS-232/422/485 serial port

Pin	
1	CM2_1
2	DSRB
3	CM2_2
4	RTSB
5	CM2_3
6	CTSB
7	CM2_4
8	RIB_OUT
9	GND
10	GND

# C.9 USB1/USB2 Connector (CN9)

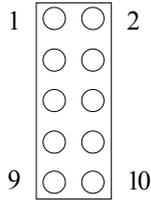
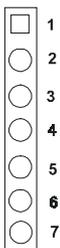


Table C-9: USB1/USB2 connector

	<b>USB1</b>		<b>USB2</b>
1	USBV0	2	USBV1
3	USBD0-	4	USBD1-
5	USBD0+	6	USBD1+
7	USBG0	8	USBG1
9	Chassis GND	10	N/C

## C.10 EBX Power Connector (CN11)

---



---

Table C-10:EBX Power Connector

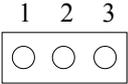
---

<b>Pin</b>	<b>signal</b>
1	+5V
2	GND
3	GND
4	+12V
5	N/C
6	GND
7	+5V

---

# C.11 CPU Fan Power Connector (CN12)

---



---

Table C-11: CPU fan power connector

---

Pin	Signal
1	GND
2	+12 V
3	FAN_DEC

---

# C.12 ATX Power Switch (CN13)

---



---

Table C-12:ATX power switch

---

Pin	Signal
1	5V SB
2	#PS_ON

---

## C.13 CD-ROM in connector (CN14)

---

Table C-13: CD-ROM connector

<b>Pin</b>	<b>Signal</b>
1	CD_R
2	GND
3	GND
4	CD_L

# C.14 Primary IDE (CN15)

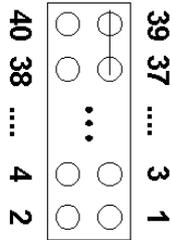


Table C-14: Primary IDE connector (CN15)

pin	signal	pin	signal
1	IDE RESET	2	GND
3	D7	4	D8
5	D6	6	D9
7	D5	8	D10
9	D4	10	D11
11	D3	12	D12
13	D2	14	D13
15	D1	16	D14
17	D0	18	D15
19	GND	20	NC
21	REQ	22	GND
23	IOW	24	GND
25	IOR	26	GND
27	READY	28	Cable Select (Pull-Low)
29	DACK	30	GND
31	IRQ14	32	NC
33	A1	34	Cable check
35	A0	36	A2
37	CS0	38	CS1
39	Active LED	40	GND

## C.15 Audio connector (CN17)

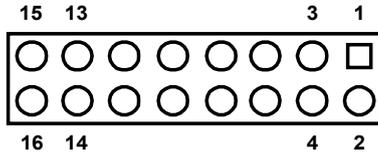


Table C-15: Audio connector (CN17)

Pin	Signal	Pin	Signal
1	SPEAKER OUT R+	2	SPEAKER OUT R-
3	SPEAKER OUT L+	4	SPEAKER OUT L-
5	LINE OUT R	6	LINE OUT L
7	GND	8	GND
9	LINE IN R	10	LINE IN L
11	GND	12	GND
13	MIC1	14	NC
15	MIC2	16	GND

## C.16 IDE Hard Drive Connector (CN18)

Table C-16: IDE hard drive connector

Pin	Signal	Pin	Signal
1	IDE RESET*	2	GND
3	DATA 7	4	DATA 8
5	DATA 6	6	DATA 9
7	DATA 5	8	DATA 10
9	DATA 4	10	DATA 11
11	DATA 3	12	DATA 12
13	DATA 2	14	DATA 13
15	DATA 1	16	DATA 14
17	DATA 0	18	DATA 15
19	GND	20	N/C
21	DRQ	22	GND
23	IO WRITE	24	GND
25	IO READ	26	GND
27	IO CHANNEL READY	28	Cable Select
29	HACKO*	30	GND
31	IRQ14	32	N/C
33	ADDR 1	34	Reserved
35	ADDR 0	36	ADDR 2
37	CS1#	38	CS3#
39	IDE ACTIVE*	40	GND
41	5 V	42	5 V
43	GND	44	NC

\* low active

## C.17 Floppy Drive Connector (CN20)

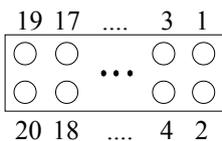


Table C-17: Floppy drive connector

Pin	Signal	Pin	Signal
1	GND	2	REDWC
3	GND	4	DS1
4	DS1	5	GND
5	GND	6	INDEX
7	GND	8	MOTSA
9	DSKCHG	10	DRVSB
11	SIDE1	12	DRVSA
13	RDATA	14	MOTEB
15	WPT	16	DIR
17	TK00	18	STEP
19	WGATE	20	WDATA



APPENDIX

# D

## System Assignments

This appendix contains information of a detailed or specialized nature. It includes:

- System I/O ports
- DMA channel assignments
- Interrupt assignments
- 1st MB memory map

# D.1 System I/O Ports

Table D-1: System I/O ports

Addr. range (Hex)	Device
000-01F	DMA controller
020-021	Interrupt controller 1, master
022-023	Chipset address
040-05F	8254 timer
060-06F	8042 (keyboard controller)
070-07F	Real-time clock, non-maskable interrupt (NMI) mask
080-09F	DMA page register
0A0-0BF	Interrupt controller 2
0C0-0DF	DMA controller
0F0	Clear math co-processor
0F1	Reset math co-processor
0F8-0FF	Math co-processor
1F0-1F8	Fixed disk
200-207	Game I/O
278-27F	Parallel printer port 2 (LPT 3)
2F8-2FF	Serial port 2
300-31F	Prototype card
360-36F	Reserved
378-37F	Parallel printer port 1 (LPT 2)
380-38F	SDLC, bisynchronous 2
3A0-3AF	Bisynchronous 1
3B0-3BF	Monochrome display and printer adapter (LPT1)
3C0-3CF	Reserved
3D0-3DF	Color/graphics monitor adapter
3F0-3F7	Diskette controller
3F8-3FF	Serial port 1

\* PNP audio I/O map range from 220 ~ 250H (16 bytes)  
MPU-401 select from 300 ~ 330H (2 bytes)

## D.2 DMA Channel Assignments

---

Table D-2: DMA channel assignments

Channel	Function
0	Available
1	Available
2	Floppy disk (8-bit transfer)
3	Available
4	Cascade for DMA controller 1
5	Available
6	Available
7	Available

\* Audio DMA select 0, 1 or 3

## D.3 Interrupt Assignments

---

Table D-3: Interrupt assignments

Interrupt#	Interrupt source
IRQ 0	Interval timer
IRQ 1	Keyboard
IRQ 2	Interrupt from controller 2 (cascade)
IRQ 8	Real-time clock
IRQ 9	Cascaded to INT 0A (IRQ 2)
IRQ 10	Available
IRQ 11	Watchdog Timer
IRQ 12	PS/2 mouse (non-releasable)
IRQ 13	INT from co-processor
IRQ 14	Fixed disk controller (primary)
IRQ 15	Fixed disk controller (secondary)
IRQ 3	Serial communication port 2
IRQ 4	Serial communication port 1
IRQ 5	Parallel port 2
IRQ 6	Diskette controller (FDC)
IRQ 7	Parallel port 1 (print port)

\* PNP audio IRQ select: 5, 7, 9 or 10

\* Ethernet function is auto-sensing

## D.4 1st MB Memory Map

---

Table D-4: 1st MB memory map

---

<b>Addr. range (Hex)</b>	<b>Device</b>
F000h - FFFFh	System ROM
C800h - EFFFh	Expansion ROM
C000h - C7FFh	System ROM
B800h - BFFFh	CGA/EGA/VGA text
B000h - B7FFh	Unused
A000h - AFFFh	EGA/VGA graphics
0000h - 9FFFh	Base memory

---