PCM-4862

All-in-One 486 Single Board
Computer with SVGA, Ethernet,
and SSD

Packing list

Before you begin installing your card, please make sure that the following materials have been shipped:

- 1 PCM-4862 All-in-One Single Board Computer

- 1 utility disk with system BIOS, VGA BIOS, and Ethernet utility programs

- 1 utility disk with SVGA utility programs and drivers for Windows 3.1 and Windows 95

- 1 utility disk with Ethernet drivers

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

Contents

General Information

This chapter gives background information on the PCM-4862.

Sections include:

- Card specifications
- Card layout and dimensions

Introduction

The PCM-4862 is an enhanced, all-in-one single board 486 computer with an on-board Ethernet interface, local-bus SVGA controller and solid state disk. The PCM-4862 offers all the functions of an AT-compatible industrial computer on a single board, but it fits in the space of a 5¼" floppy drive (only 5.75" x 8"). For maximum performance, the PCM-4862 also supports 2nd level cache sizes from 128 KB to 512 KB (32 KB x 8, 64 KB x 8, or 128 KB x 8).

On-board features include two serial ports (RS-232 and RS-232/422/485), one parallel port, an enhanced IDE hard-drive controller (for up to two drives), a floppy-drive controller and a keyboard/PS/2 mouse interface. The board's watchdog timer can automatically reset the system or generate an interrupt if it stops due to a program bug or EMI problem.

An on-board solid state disk (SSD) emulates a floppy drive using EPROM or Flash memory devices. You access the SSD using standard DOS commands or BIOS I/O. The system can even boot from the SSD. Disk capacity is up to 1.44 MB, depending on the size of the memory chips. If you use Flash memory, you can read and write to the disk just like a floppy. If you use EPROM, the disk is read-only and you must program the chips with an EPROM programmer.

The PCM-4862 also complies with the "Green Function" standard and supports three types of power saving features: Doze mode, Standby mode, and Suspend mode.

All display and Ethernet configuration is done through software. A single Flash chip holds the system BIOS, VGA BIOS and the network boot ROM image. This minimizes the number of chips and eases configuration. You can change the display BIOS or install a boot ROM simply by programming the Flash chip.

If you need any additional functions, you can add up to six industry-standard PC/104 expansion modules. For those who require special functions, we have developed a PC/104 to ISA adaptor so you can use your standard ISA card.

Features

- 80486SX/DX/DX2/DX4 processor, selectable clock speed
- Up to 512 KB 2nd level cache
- 16-bit Ethernet interface on-board, Novell NE2000 compatible
- Local-bus SVGA display controller (LCD, EL and CRT displays), flat panel type configured by programming the Flash chip
- Sockets for 1.44 MB solid state disk using Flash memory or EPROM
- Supports M-Systems DiskOnChip (DOC) 2000
- Up to 64 MB of on-board DRAM
- Built-in enhanced IDE (AT bus) hard disk drive interface
- Built-in floppy disk drive controller
- On-board keyboard/PS/2 mouse connector
- Two serial ports: one RS-232, one RS-232/422/485 selectable (uses 16C550 UARTs with 16 byte FIFO)
- One multi-mode parallel port (ECP/EPP/SPP)
- Watchdog timer
- ISA-bus expansion with PC/104 modules
- Dimensions: 5.75" x 8" (146 mm x 203 mm)
- Power management
- Single +5 V power supply

Specifications

Standard SBC functions

- **CPU**: 80486SX/DX/DX2/DX4-25/33/40/66/80/100/120
- **BIOS**: AWARD 128 KB Flash memory
- **Chipset**: VIA VT82C496G
- **2nd level cache**: On-board 128 KB, up to 512 KB (SOJ package)
- **RAM memory**: 1 MB to 64 MB. Two 72-pin SIMM sockets (accepts 1 MB, 2 MB, 4 MB, 8 MB, 16 MB and 32 MB)

- **Enhanced IDE hard disk drive interface**: Supports up to two IDE (VL- bus) hard disks. BIOS auto-detect

- **Floppy disk drive interface**: Supports up to two floppy disk drives, 3½" (720 KB, 1.44 and 2.88 MB) and/or 5¼" (360 KB and 1.2 MB)

- **Multi-mode parallel port**: Configured to LPT1, LPT2, LPT3 or disabled. Supports SPP/ECP/EPP

- **Serial ports**: One serial RS-232 port, one serial RS-232/422/485 port. Ports can be configured as COM1, COM2, COM3, COM4 or disabled individually. Two 16550 serial UARTs

- **Battery**: 3.6 V @ 600 mAh lithium battery for up to 10 years of data retention

- **Watchdog timer**: Can generate a system reset or IRQ15. Software enabled/disabled. Time interval is 1.6 seconds

- **DMA channels**: 7

- **Interrupt levels**:15

- **Keyboard/mouse connector**: 8-pin connector supports standard PC/AT keyboard and a PS/2 mouse

- **Power management**: I/O peripheral devices support power saving and doze/standby/suspend modes. AMP 1.1 compliant

Local-bus flat panel/VGA interface

- **Chipset**: C&T 65545

- **Display memory**: 512 KB VRAM (standard), 1 MB VRAM (optional)

- **Display type**: Supports CRT and flat panel (EL, LCD and gas plasma flat panel) display. Can display CRT and flat panel simultaneously

- **CRT display mode**: Supports resolutions up to 1024 x 768. Non-interlaced CRT monitors resolutions up to 1024 x 768 @ 256 colors. True-color and Hi-color display capability with flat panels and CRT monitors at 640 x 480 resolution.

- **Panel display modes**: Supports resolutions up to 800 x 600 @ 256 colors (1 MB VRAM)

Ethernet controller function

- **Chipset**: Realtek RTL8019AS
- **Type**: 16-bit Ethernet, Novell NE 2000 compatible
- **Connector**: 10BASE-T and AUI connector on-board

Solid state disk function

- **Sockets**: Three 32-pin sockets for FLASH/EPROM
- **FLASH type**: ATMEL 29C010/29C040/29C040A (+5 V); AMD/ INTEL 28F010 (+12 V)
- **Size**: 360 KB/720 KB/1.2 MB/1.44 MB
- **Utility software**: Includes software to prepare files for EPROM
- **Supports M-Systems DiskOnChip (DOC) 2000**

PC/104 bus expansion

- **PC/104**: 104-pin connector for a 16-bit bus
- **Driving capacity**: Six PC/104 modules

Mechanical and environmental

- **Power supply voltage**: +5 V (4.75 V to 5.25 V)
- **Max. power requirements**: +5 V @ 2 A (typical)
- **Operating temperature**: 32 to 140°F (0 to 60°C)
- **Board size**: 8" (L) x 5.75" (W) (203 mm x 146 mm)
- **Weight**: 0.5 kg

Board layout and dimensions

Dimensions in mm

PCM-4862 dimensions

Installation

This chapter tells how to set up the PCM-4862 hardware, including instructions on setting jumpers and connecting peripherals, switches and indicators. Be sure to read all the safety precautions before you begin the installation procedure.

Jumpers and connectors

Connectors on the board link it to external devices such as hard disk drives, a keyboard, or floppy drives. In addition, the board 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 jumpers and connectors:

Jumpers	
Label	**Function**
J1	System clock setting
J2	System clock setting
J3	System clock setting
J4	CPU power supply
J5	CPU type select
J6	CPU power supply
J7	CPU type select
J8	CPU type select
J9	CPU type select
J10	CPU type select
J11	CPU type select
J12	CPU type select
J13	CPU type select
J14	CMOS setup
J15	ECP/EPP DMA channel
J16	ECP/EPP DMA channel
J17	CPU type select
J18	CPU type select
J19	CPU type select
J20	Parallel port IRQ
J21	Buzzer enable/disable
J22	Factory reserved
J23	Watchdog timer invokes IRQ15
J24	Watchdog timer invokes system reset
J25	External battery input for CMOS data retention
J26	Ethernet CRS LED

Jumpers, cont.

Label	Function
J27 (1,2)	SSD I/O address selection
J27 (3,4)	SSD I/O address selection
J27 (5,6)	SSD memory address selection
J27 (7,8)	SSD memory address selection
J27 (9,10)	SSD drive emulated
J27 (11,12)	SSD drive emulated
J28	Ethernet BNC LED
J29	SSD hardware enable/disable
J30	SSD device type and selection
J31	SSD device type and selection
J32	COM2 RS-232/422/485 selection

Connectors

Label	Function
CN1	CRT display connector
CN2	Flat panel display connector
CN3	PC/104 ISA-bus expansion
CN4	Front panel connector
CN5	PC/104 ISA-bus expansion
CN6	Peripheral power connector (-5V, -12V)
CN7	Ethernet 10BASE-2/10BASE-5 AUI connector
CN8	Serial port COM2 (RS-232/422/485)
CN9	Keyboard and mouse connector
CN10	Ethernet 10BASE-T connector
CN11	Main power connector (+5V, +12V)
CN12	IDE hard drive connector
CN13	Serial port COM1 (RS-232)
CN14	Fan Power connector
CN15	Floppy drive connector
CN16	Parallel port connector

Locating jumpers

10BASE-2/10BASE-5
AUI Connector CN7

10BASE-T CN10

Fan Power
CN14

Main Power
CN11

Keyboard/
Mouse
connector
CN9

Floppy Disk
CN15

IDE Hard Disk
CN12

Parallel
CN16

PC/104
CN3, CN5

SIMM
Sockets

CRT Display
CN1

Flat Panel
Display
CN2

Front
Panel
CN4

Peripheral
Power
CN6

COM2
CN8

COM1
CN13
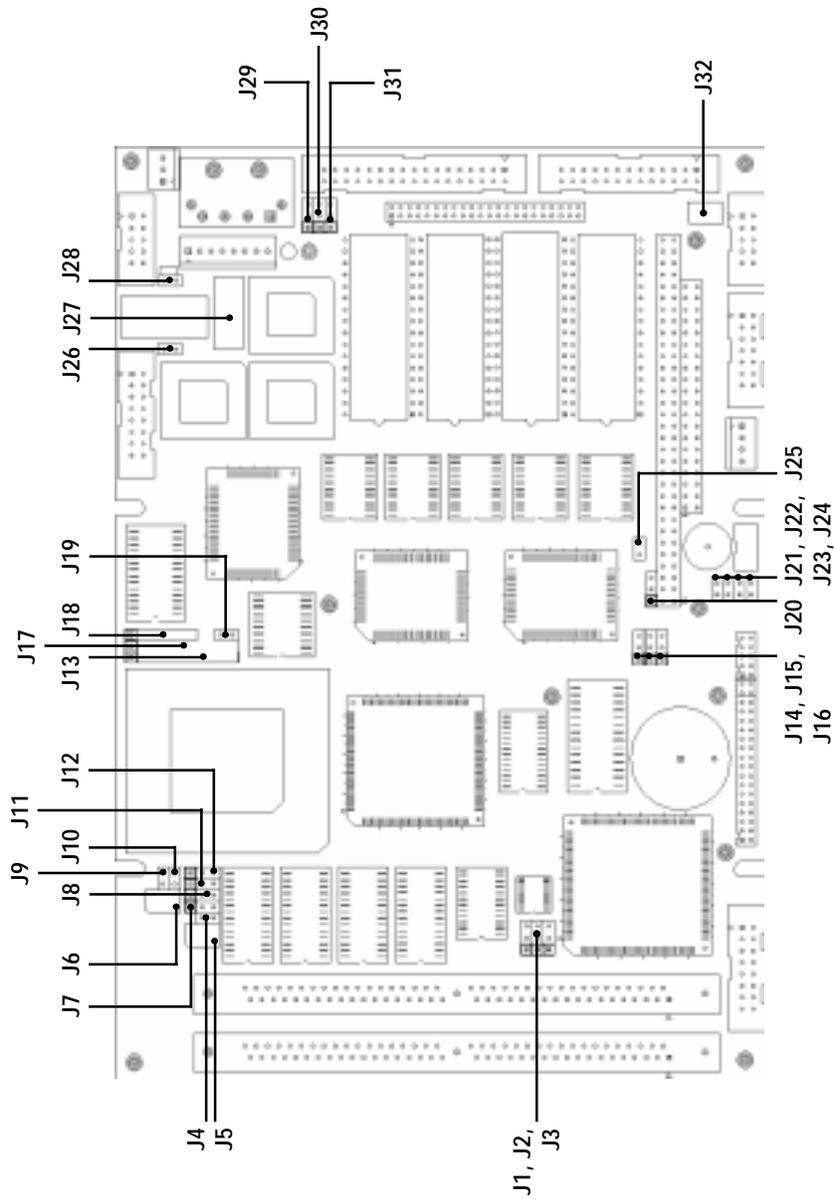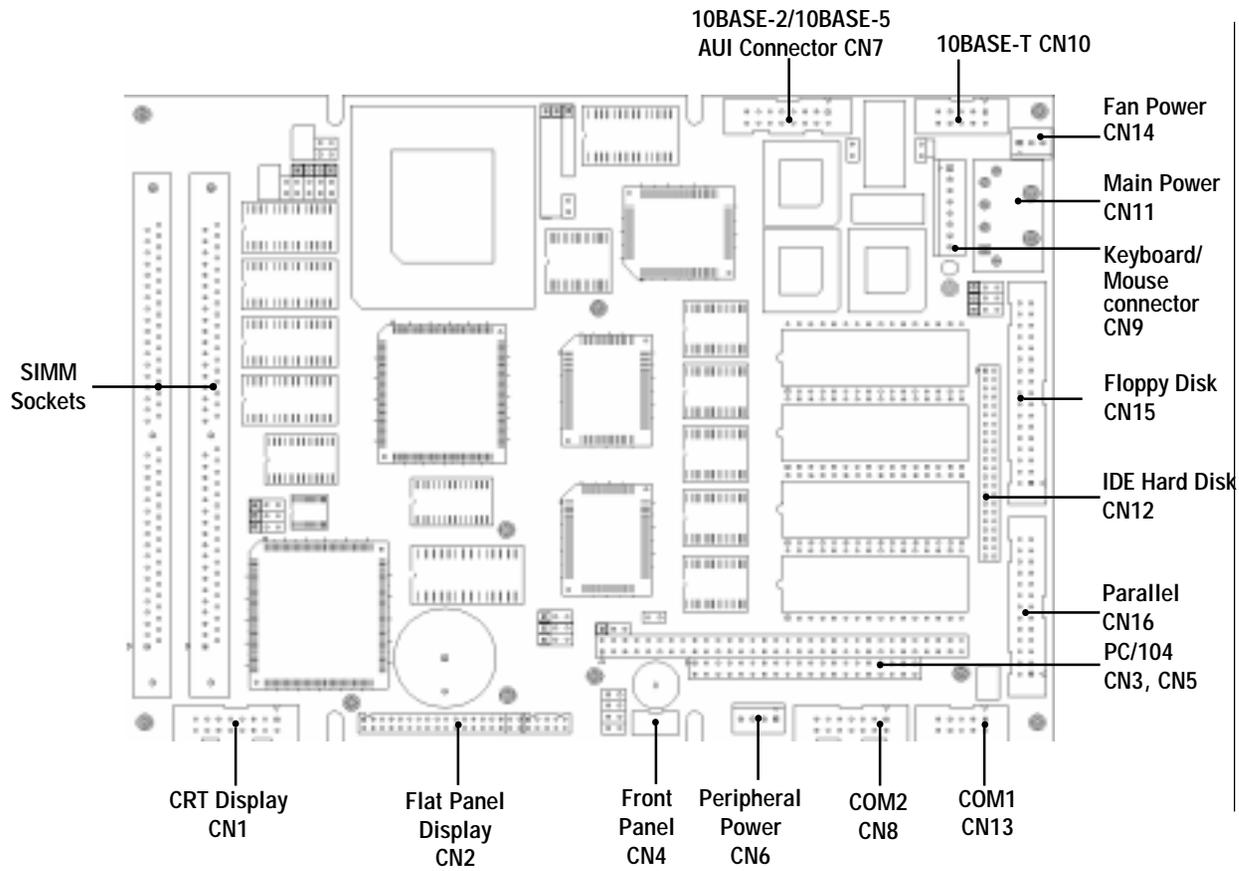
Setting jumpers

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 you connect the pins with the clip. To "open" a
jumper you 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.
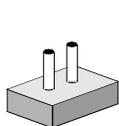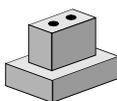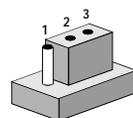
Open   Closed   Closed 2-3

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.

If you have any doubts about the best hardware configuration for
your application, contact your local distributor or sales representa-
tive before you make any changes.

Safety precautions

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 because sensitive electronic components can be damaged by the 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.*

Installing the CPU

The PCM-4862 all-in-one CPU module supports most 486 CPUs. The system's performance depends on the CPU you choose. You can install or upgrade the CPU in the board's PGA socket by following the procedures outlined below. If your system has an existing CPU, you need to remove it before installing the new CPU.

Removing a CPU

1. Disconnect power from the chassis, and unplug all connections to the CPU card. Then, remove the CPU card from the chassis by following the instructions in the user's manual for your chassis.

2. Lift the CPU out of the PGA socket. The old chip may be difficult to remove. You may find spray chip lubricant, designed for pin-grid-array (PGA) devices, and a chip puller helpful. These are available at electronics hobbyists' supply stores.

Installing a CPU

To install the CPU, follow the instructions that came with it. If no documentation was provided, the general procedures for installing a CPU are outlined below:

1. Lubricate the pins on the CPU with lubricant for PGA devices. This makes the CPU slide in much easier and greatly reduces the chance of damaging the pins and other components.

2. Carefully align the CPU so that it is parallel to the socket. Make sure that the notch on the corner of the CPU matches the notch on the inside of the socket.

3. Gently push the CPU into the socket. There will probably be a small gap between the CPU and the socket even when it is fully seated. DO NOT USE EXCESSIVE FORCE!

When you install a new CPU, you may have to adjust other settings on the board, such as CPU type, CPU clock, and PCI speed, to accommodate it. Make sure that the settings are correct for your CPU. **Improper settings may damage the CPU.**

CPU type select (J1-J13, J17-J19)

The following chart shows the proper jumper settings for their respective CPUs.

CPU type select

AMD 486DX2-66 (3 V) and
AMD 486DX4-100

TI 486DX-66
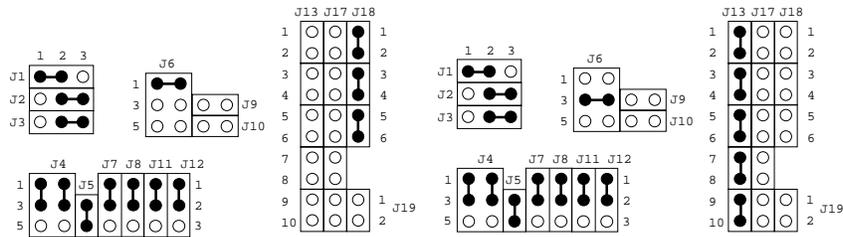
AMD 486DX4-120

AMD 5x86-P75
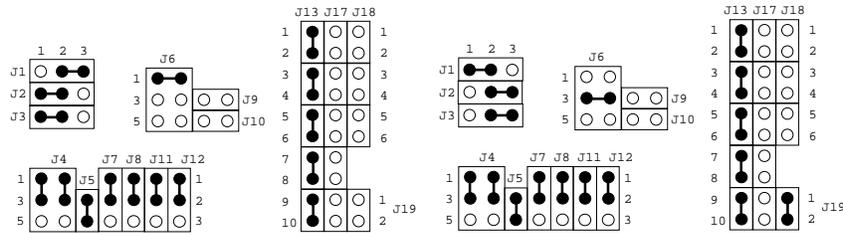
Cyrix 486DX2-66

Cyrix 486DX2-V80GP
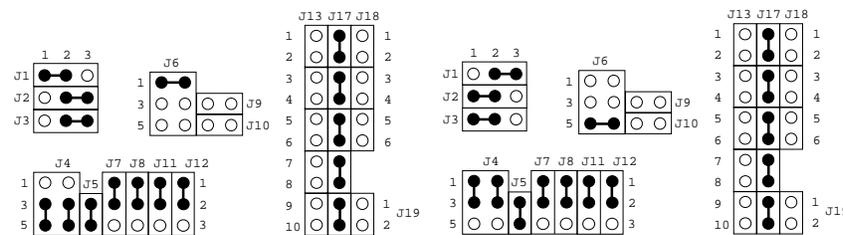
Cyrix 486DX4-100

Cyrix 5x86-100

J13 J17 J18

1 2 3
J1
J2
J3

J6
1
3
5

J9
J10

J4   J7 J8 J11 J12
1   J5   1
3   2
5   3

1
2
3
4
5
6
7
8
9
10

J19
1
2
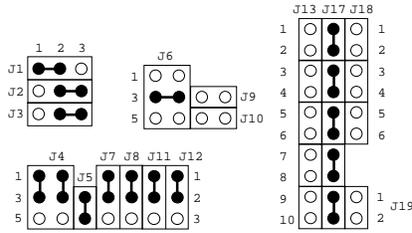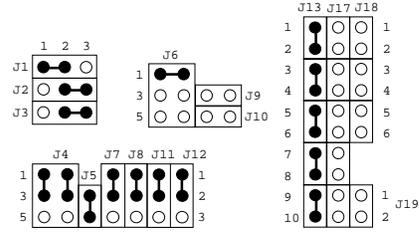
Cyrix 5x86-120
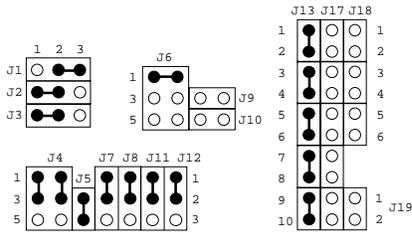
IBM 486DX4
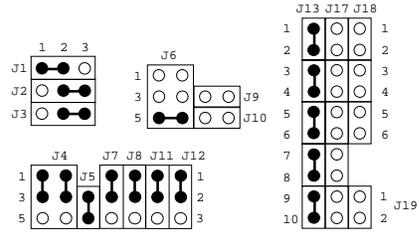
Intel 486DX-25
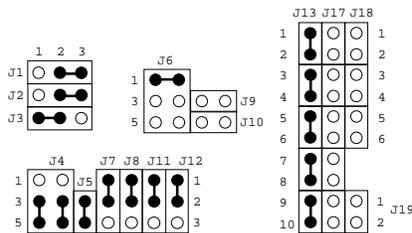
Intel 486DX2-66
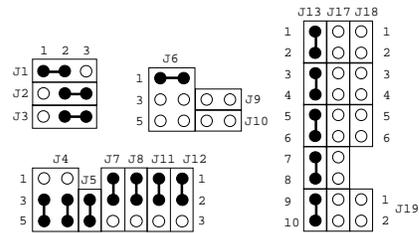
*Intel 486DX4-100 (default)
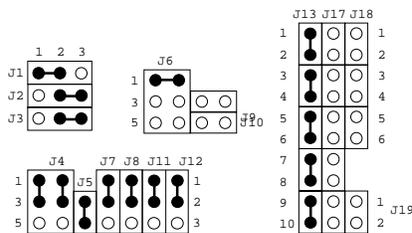
SGS 486DX2-66
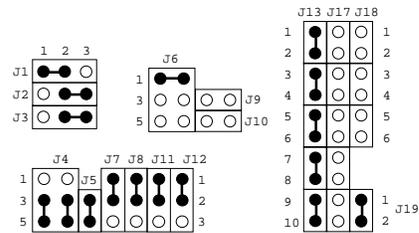
CPU power supply select (J4, J6)

J4 and J6 must be set to match the CPU type. The chart below shows the proper jumper settings for their respective V_{CC}.

CPU power supply select				
	*3.3 V	3.45 V	3.6 V	5 V
J4	1-3	1-3	1-3	3-5
	2-4	2-4	2-4	4-6
J6	1-2	3-4	5-6	—

CPU clock select (J1, J2, J3)

J1, J2, and J3 are used to synchronize the CPU clock with the CPU type. Set the CPU clock according to the base CPU speed.

CPU clock select			
	25 MHz	*33 MHz	40 MHz
J1	2-3	1-2	2-3
J2	2-3	2-3	1-2
J3	1-2	2-3	1-2

CMOS setup (J14)

CMOS setup		
	*3.6V Battery On	Clear CMOS
J14	1-2	2-3

Buzzer enabled/disabled (J21)

Buzzer enabled/disabled		
	Enable	Disable
J21	●—●	○ ○

* default setting

*

Installing DRAM (SIMMs)

You can install anywhere from 1 MB to 32 MB of on-board DRAM memory using 1, 2, 4, 8 or 16 MB 72-pin SIMMs (Single In-Line Memory Modules). Access time should be 70 nsec. or less.

Memory installs in two banks composed of one SIMM socket each. The banks are designated as Bank0 and Bank1. See the figure on page 11 for help identifying the banks. It supports both single and dual insertion

Installing SIMMs

NOTE: The modules can only fit into a socket one way.
          Their chips must face the CPU, and their gold
          pins must point down into the SIMM socket.

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

1. Ensure that all power supplies to the system are switched Off.

2. Locate the board's memory banks, shown in the figure on page 11.

3. Install the SIMM cards. Install each SIMM so that its chips face away from the CPU and its gold pins point down into the SIMM socket.

4. Slip each SIMM into a socket at a 45 degree angle and carefully fit the bottom of the card against the connectors.

5. Gently push the SIMM into a perpendicular position until the clips on the ends of the SIMM sockets snap into place.

6. Check to ensure that each SIMM is correctly seated and all connector contacts touch. The SIMM should not move around in its socket.

IDE hard drive connector (CN12)

The built-in Enhanced IDE (Integrated Device Electronics) controller supports up to two IDE devices, including CD-ROM drives, tape backup drives, a large hard disk drive and other IDE devices. It also supports faster data transfer rates and allows the IDE hard disk drive to exceed 528 MB.

Connecting the hard drive

Connecting drives is done in a daisy-chain fashion and requires one of two cables, 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.

1. Connect one end of the cable to CN12. 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).

2. Plug the other end of the cable to 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.)

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 just one drive, set it as the master.

Floppy drive connector (CN15)

You can attach up to two floppy disks to the PCM-4862's on-board controller. You can use any combination of 5¼" (360 KB and 1.2 MB) and/or 3½" (720 KB, 1.44 MB, and 2.88 MB) drives.

A 34-pin daisy-chain drive connector cable is required for a dual-drive system. On one end of the cable is a 34-pin flat-cable connector. On the other end are two sets of floppy disk drive connectors. Each set consists of a 34-pin flat-cable connector (usually used for 3½" drives) and a printed-circuit board connector (usually used for 5¼" drives).

Connecting the floppy drive

1. Plug the 34-pin flat-cable connector into CN15. Make sure that the red wire corresponds to pin one on the connector.

2. Attach the appropriate connector on the other end of the cable to the floppy drive(s). You can use only one connector in the set. The set on the end (after the twist in the cable) connects to the A: drive. The set in the middle connects to the B: drive.

3. If you are connecting a 5¼" floppy drive, line up the slot in the printed circuit board with the blocked-off part of the cable connector.
   If you are connecting a 3½" floppy drive, you may have trouble determining which pin is pin number one. Look for a number printed on the circuit board indicating pin number one. Also, the connector on the floppy drive connector may have a slot. When the slot is up, pin number one should be on the right. Check the documentation that came with the drive for more information.

   If you desire, connect the B: drive to the connectors in the middle of the cable as described above.

If you need to make your own cable, you can find the pin assignments for the card's connector in Appendix C.

Parallel port connector (CN16)

Normally, the parallel port is used to connect the card to a printer. The PCM-4862 includes an on-board parallel port, accessed through CN16, a 26-pin flat-cable connector. You will need an adapter cable if 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.

Parallel port IRQ

The PCM-4862 supports one parallel port. The port is designated as LPT1 and can be disabled or changed to LPT2 or LPT3 in the system BIOS setup.

Parallel port IRQ selection		
	IRQ5	*IRQ7
J20	●━● ○ 1 2	○ ●━● 2 3

You can select ECP/EPP DMA channel by setting J15 and J16.

ECP/EPP DMA channel		
	*DMA1	DMA3
J15	●━● ○	○ ●━●
J16	●━● ○ 1 2	○ ●━● 2 3

* default setting

Keyboard and PS/2 connector (CN9)

The PCM-4862 board provides a keyboard connector which supports both a keyboard and a PS/2 style mouse. In most cases, especially in embedded applications, a keyboard is not used. The standard PC/AT BIOS will report an error or fail during power-on self test (POST) after a reset if the keyboard is not present. The PCM-4862's BIOS standard setup menu allows you to select "All, But Keyboard" under the "Halt On" selection. This allows no-keyboard operation in embedded system applications without the system halting under POST (power-on-self-test).

Front panel connector (CN4)

Next you may want to install external switches to monitor and control the PCM-4862. These features are completely optional — install them only if you need them. The front panel connector (CN4) is an 8-pin male, dual in-line header and provides connections for a speaker, hard disk access indicator and an input switch for resetting the card.

Speaker

The PCM-4862 can drive an 8 Ω speaker at 0.5 watts. Ensure that alternatives to this specification do not overload the card.

LED interface

The front panel LED indicator for hard disk access is an active low signal (24 mA sink rate).

Reset switch

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

If you need to make your own cable, you can find the pin assignments for the card's connector in Appendix C.

Power connectors (CN6, CN11, CN14)

Peripheral power connector, -5V, -12V (CN6)

Supplies secondary power to devices that require -5 V and -12 V.

Main power connector, +5V, +12V (CN11)

Supplies main power to the PCM-4862 (+5 V) and devices that require +12 V.

Fan power supply connector (CN14)

Provides power supply to optional CPU cooling fan. Only present

when +5 V and +12 V power is supplied to the board.

Serial ports (CN13, CN8)

The PCM-4862 offers two serial ports: one RS-232 and one RS-232/
422/485. These ports let you connect to serial devices (a mouse,
printers, etc.) or a communication network.

COM1 RS-232 port (CN13)

The serial port connectors are mounted on the bottom edge of the
card. The 10-pin, dual-in-line, male header to the right of the card is
the RS-232 port.

COM2 RS-232/422/485 selection (CN8)

The secondary port, to the left of COM1, consists of a 14-pin, dual-
in-line, male header and can be configured to operate in RS-232, RS-
422, or RS-485 mode. This is done via J32.

COM2 selection

```
  1 ┌──●──┐ 2        1 ┌ ○  ○ ┐ 2        1 ┌ ○  ○ ┐ 2
  * 3  RS-232          RS-422  4        3  RS-485
    5 └ ○  ○ ┘ 6        5 └ ○  ○ ┘ 6        5 └──●──┘ 6
```
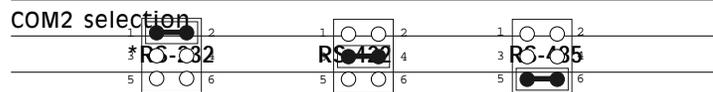
J32

---

* default setting

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 PCM-4862's ports.

PCM-4862 Serial port default settings

Port	Address Range	Interrupt	Default
COM1	2E8~3F8	IRQ4	3F8

COM2	2E8~3F8	IRQ3	2F8

VGA interface connections

The PCM-4862's SVGA interface can drive conventional CRT displays and is capable of driving a wide range of flat panel displays, including electroluminescent (EL), gas plasma, passive LCD and active LCD displays. The card has two connectors to support these displays, one for standard CRT VGA monitors and one for flat panel displays.

CRT display connector (CN1)

CN1 is a 16-pin, dual-in-line header used for conventional CRT displays. A simple one-to-one adapter can be used to match CN1 to a standard 15-pin D-SUB connector commonly used for VGA.

Pin assignments for CRT display connector CN1 are detailed in Appendix C.

Flat panel display connector (CN2)

CN2 consists of a 44-pin, dual-in-line header. Power supplies (+12 V) present on CN2 depend the supply connected to the board. Ensure that CN11 is connected for +12 V power supply.

The PCM-4862 provides a bias control signal on CN2 which can be used to control the LCD bias voltage. It is recommended that the LCD bias voltage not be applied to the panel until the logic supply voltage (+5 V) and panel video signals are stable. Under normal operation the control signal (ENAVEE) is active high. When the PCM-4862's power is applied, the control signal is low until just after the relevant flat panel signals are present.

Configuration of the VGA interface is done completely via the software utility. You don't have to set any jumpers. Refer to Chapter 3 for software setup details.

Refer to Chapter 3 for details on connecting the four standard LCD's: Sharp LM64183P, Toshiba LTM09C016, Sharp 64C142, and Planor EL Display.

Ethernet configuration

The PCM-4862 is equipped with a high performance 16-bit Ethernet interface which is fully compliant with IEEE 802.3 10Mbps CSMA/CD standards. It is supported by all major network operating systems and is 100% Novell NE-2000 compatible.

Configuration of the Ethernet is very easy and can be done via the RSET8019.EXE program included on the utility disk. This program enables you to: view the current Ethernet configuration, to reconfigure the Ethernet interface (IRQ, I/O address, etc.), and to execute useful diagnostic functions. (See Chapter 3 for detailed information)

The RSET8019.EXE program provides two ways to configure the Ethernet interface. Configuration can be done automatically when you choose PNP (plug and play) option; or, when you choose the Jumperless option, the following IRQ and I/O address settings are available.

PCM-4862 Ethernet settings		
	IRQ option	I/O address range
Jumperless Configuration	2, 3, 4, 5, 10, 11, 12, 15	200 - 300 EFH
Default Settings: IRQ = 3 ; I/O Address = 300H		

Note: 1. You can select an IRQ from the options shown above, but make sure your selection does not conflict with other I/O devices.
2. When Boot ROM is installed, the RSET8019.EXE program does not support PNP mode configuration.

10BASE-2/10BASE-5 AUI connector (CN7)

10BASE-2 and 10BASE-5 coax connections are made via an attachment unit interface or AUI (CN7). This consists of a 16-pin, dual-in-line male header.

10BASE-T connector (CN10)

10BASE-T connects to the PCM-4862 via an adapter cable to a 10-pin polarized header (CN10). For 10BASE-T RJ-45 operation, an adapter cable converting CN10 into a standard RJ-45 jack is required.

Network boot

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 available from your supplier. They can be programmed into the BIOS, similar to the VGA BIOS file, using the AWDFLASH.EXE program detailed in Chapter 3.

Watchdog timer configuration

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 two jumpers and running the control software (refer to Appendix A).

Watchdog timer enable/disable

You can enable or disable the watchdog timer by reading the card's I/O ports with your program. Read address 443 hex to enable and refresh the watchdog or address 043 to disable the watchdog. For information on programming the watchdog timer see Appendix A.

Watchdog timer action (J23, J24)

When the watchdog timer activates (CPU processing has come to a halt), it can reset the system or generate an interrupt on IRQ15. This can be set via two 2-pin jumpers (J23, J24) as shown below:

Watchdog timer system reset/IRQ15		
	*System reset	IRQ15
J23	◯ ◯	●━●
J24	●━●	◯ ◯

* default setting

Solid State Disk Configuration

This section will explain the function and configuration of the jumpers necessary for the operation of the PCM-4862's solid state disk (SSD). The SSD is optional and can be utilized by inserting memory devices onto the board. Jumpers relevant to SSD configuration are:

PCM-4862 SSD Jumpers	
Number	Function
J27 (1,2)	SSD I/O address selection
J27 (3,4)	SSD I/O address selection
J27 (5,6)	SSD memory address selection
J27 (7,8)	SSD memory address selection
J27 (9,10)	SSD drive emulated
J27 (11,12)	SSD drive emulated
J29	SSD harware enable/disable
J30	SSD ROM device selection
J31	SSD memory type selection

The PCM-4862 features an internal Flash/ROM disk drive. This drive emulates a floppy disk drive by using solid-state memory chips (Flash or EPROM) to store programs and data instead of the magnetic particles on the mechanical drive's disk. The Flash/ROM disk offers much faster access times than a floppy or hard disk and greatly increased reliability in harsh environments.

The Flash/ROM disk works by modifying the BIOS INT-13 disk I/O routine on boot-up. The routine then translates read and write commands to the disk so that they will correctly access the memory chips. You don't need any special drivers. You simply set the drive to act as a DOS drive (e.g. A: or C:) and use standard DOS commands (COPY, DIR, etc.) to manipulate your data.

Before you use the Flash/ROM disk, you will need to enable it with J29 and the BIOS Chipset Features Setup Program as detailed in Chapter 4.

Memory devices

The Flash/ROM disk supports the following memory devices, or their equivalents:

- 27C010 128 KB x 8 EPROM

- 27C040 512 KB x 8 EPROM

- 28F010 128 KB x 8 +12 V Flash Memory (AMD/INTEL)

- 29C010 128 KB x 8 +5 V Flash Memory (ATMEL only)

- 29C040 512 KB x 8 +5 V Flash Memory (ATMEL only)

- 29C040A 512 KB x 8 +5 V Flash Memory (ATMEL only)

If you use EPROM, files on the disk are read only. You will need an external programmer to load your program and data files on the EPROMs.

If you use +5 V Flash memories (29C010) for the solid state disk, you can read or write data just like a floppy disk; you need not use an external programmer. If you use +12 V Flash memories (28F010) you will still need an external programmer to write data.

Before you activate the Flash/ROM drive (using the BIOS Chipset Features Setup program), you will need to set the drive's I/O and memory addresses to avoid conflicts with other plug-in cards. You will also need to set the DOS drive designation to be used by the Flash/ROM drive. The following jumpers sets the configuration of the SSD as described in the following sections:

Memory address selection (J27)

The SSD occupies a 8 Kbyte window in the upper memory address range of D6000 to D7FFF. You should ensure this does not conflict with any other device's memory address. Jumpers J27 (5-6, 7-8) control the Flash/ROM disk's memory address. If you select "Disabled", the disk will not function.

D6000 to D7FFF (default)

J27
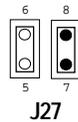
PCM-4862 SSD memory address		
Memory address (HEX)	5, 6	7, 8
Disabled	○	○
DE000 to DFFFF	●	○
D6000 to D7FFF*	○	●

○ = Open   ● = Closed   * = Default

These addresses might conflict with the ROM BIOS on some of your other boards (i.e. PC/104 modules). Read the manuals for these modules to ensure there is no memory conflict.

I/O address selection (J27)

Jumpers J27 (1-2, 3-4) control the disk's I/O address. The default is set to 200~204 but should be set as to not conflict with the I/O address of other devices. Jumpers are set as shown below:

200~204 (default)

J27
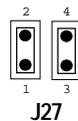
PCM-4862 SSD I/O address		
I/O address (HEX)	1, 2	3, 4
2C0-2C4	○	○
240-244	●	○
280-284	○	●
200-204*	●	●

○ = Open   ●= Closed   * = Default

Drive emulated (J27)

Jumpers J27 (9-10, 11-12) control the DOS drive emulated by the Flash/ROM disk as 1st, 2nd, 3rd or 4th as shown below:

3rd Drive (default)

J27

PCM-4862 SSD drive designation		
Drive	9, 10	11, 12
1st	●	●
2nd	●	○
3rd*	○	●
4th	○	○

○ = Open   ●= Closed   * = Default

The actual drive letter assigned by DOS to the Flash/ROM disk depends on the floppy or hard disks installed in the system and the DOS version.

SSD device and size selection (J31, J30)

The size of the emulated drive depends on the size and number of the chips you install. For example, if you install three 512 KB chips, you will have 3 x 512 KB = 1.5 MB, equivalent to a 1.44 MB floppy. The following table shows the memory chips you will need to emulate 360 KB, 720 KB, 1.2 KB and 1.44 floppy drives.

You will need to set jumpers J31 and J30 to match the type (Flash or ROM) and size (128 KB or 512 KB) of the devices you use. All the devices must be the same type and size.

EPROM 1.44 MB (default)
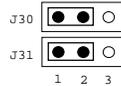
The following table shows the size and number of devices you will need for each size emulated disk. It also shows the corresponding settings of jumpers J31 (Flash/ROM) and J30 (size 128 KB/512 KB).

PCM-4862 SSD device type and selection

J30	J31	Device	360KB	720KB	1.2MB	1.44MB
1-2	1-2	ROM	512KBx1	512KBx2	512KBx3	512KBx3
2-3	1-2	ROM	128KBx3	—	—	—
2-3	2-3	Flash	128KBx3	—	—	—
1-2	2-3	Flash	512KBx1	512KBx2	512KBx3	512KBx3

SSD hardware enable/disable (J29)

As previously mentioned, before you use the SSD you have to enable it. This is done via the BIOS and a single three pin jumper (J29). The jumper overrides the BIOS, even if you set the SSD to enable in BIOS, it will not work unless the jumper is in place as the table shows below:

SSD enabled (default)
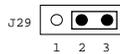
PCM-4862 SSD hardware enable/disable	
J29	
Enable*	○ ● ● 1 2 3
Disable	● ● ○ 1 2 3

* = Default

DOS 5.0

Floppy disks

The Flash/ROM disk will replace the corresponding floppy disk. For example, if you have a single floppy disk (drive A:) and assign the Flash/ROM disk to be the 1st drive, any drive operations directed at drive A: will go to the Flash/ROM disk. You will not be able to access the floppy drive.

Hard disks

The Flash/ROM disk will not replace corresponding hard disks. Instead, DOS will assign the Flash/ROM disk to the next free drive designation. For example, if you have a single hard disk (drive C:) and assign the Flash/ROM disk to be the 3rd drive, the Flash/ROM drive will become drive D:. If you have two hard disks, the Flash/ROM drive will become drive E:.

DOS 3.3

Floppy disks

The Flash/ROM disk will replace the corresponding floppy disk. For example, if you have a single floppy disk (drive A:) and assign the Flash/ROM disk to be the 1st drive, any drive operations directed at drive A: will go to the Flash/ROM disk. You will not be able to access the floppy drive.

Hard disks

The Flash/ROM disk will take the drive letter of the hard disk and DOS will assign the hard disk to the next available drive letter. For example, if you have a single hard disk (drive C:) and assign the Flash/ROM disk to be the 3rd drive, the Flash/ROM drive will become drive C: and the hard disk will become drive D:. If you have two hard disks, the Flash/ROM drive will become drive C:, the first

hard disk will become drive D: and the second hard disk will become drive E:.

Example

Before installing Flash/ROM disk

	A	B	C
DOS 5.0	FDD	FDD	HDD
DOS 3.3	FDD	FDD	HDD

After installing Flash/ROM disk

	A	B	C	D
DOS 5.0	FDD	FDD	HDD	Flash/ROM
DOS 3.3	FDD	FDD	Flash/ROM	HDD

Booting from the Flash/ROM disk

If you wish to have the system boot from the Flash/ROM disk, simply set both J27(9-10, 11-12) closed to select the 1st FDD. Copy your application files to the disk along with the standard system files required to boot (command.com, io.sys, autoexec.bat, etc). The next time you start the system, it will boot from the solid state disk.

Inserting memory devices

After you've set all the jumpers on the PCM-4862, insert the appropriate memory devices into the card's sockets. Remember that you will need to program EPROMs before you insert them.

1. Make sure that the pins of the memory chips are perpendicular to the case and both rows are parallel to each other. Often the chips come with the pins spread out slightly. Place the chip on a table top and carefully bend each line of pins together until they point directly down.

2. Insert each chip. Align the chips so their pins are perpendicular to the connector and the semicircular notch on the end of the chip matches the notch on the end of the socket. There will probably be a gap between the chip body and the socket when it is fully seated **– Do not push too hard!.**

Notches
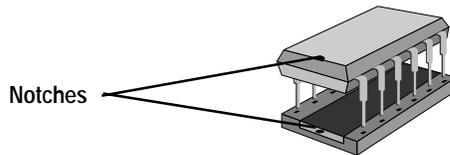
Using a memory manager (EMM386.EXE)

If you are using an extended or expanded memory manager (such as EMM386 or QEMM386), you will need to configure it to avoid the addresses used by the Flash/ROM disk (set by jumpers J30 and J31). Otherwise, the memory manager will attempt to use these addresses, causing unreliable operation.

For example, the line in your CONFIG.SYS file that invokes EMM386, the DOS memory manager, might be the following:

```
DEVICE=EMM386.SYS X=D600-D7FF
```

This excludes a 8 KB range for the card from D6000 to D7FFF (the default addresses).

If you are using expanded memory, you will need to make sure that the memory manager is not putting the page frame in the disk's addresses. For example,

```
DEVICE=EMM386.EXE X=D600-D7FF FRAME = D800
```

You should also make sure that the disk's memory address is not shadowed in the BIOS.

User's Note: Sometimes, it is better to assign the sectors and tracks when formatting an SSD. For different disk sizes, you must use different assignments, for example:

```
Format drive:/u/n:9/t:40        (for 360K disk)
Format drive:/u/n:18/t:80       (for 1.44M disk)
        (drive is the disk label, such as A or B)
```
After formatting, please read the on-screen message carefully. DOS will provide information on total and available disk space, bad sectors, etc. If the disk size does not match your assignment, please check the system settings again, such as the switches and jumpers. If you need a bootable disk, you should do the system transfer by typing:
```
   SYS drive         (drive is the disk label, such as A: or B:)
```

Software Configuration

This chapter details the software configuration information. It shows you how to configure the card to match your application requirements. AWARD System BIOS is covered in Chapter 4.

Sections include:

• LCD display configuration

• Connections for four standard LCDs

• Ethernet interface configuration

Introduction

The PCM-4862 system BIOS and custom drivers are located in a 128 Kbyte, 32-pin (JEDEC spec.) Flash ROM device, designated U28. A single Flash chip holds the system BIOS, VGA BIOS, and network Boot ROM image. The display can be configured via software. This method minimizes the number of chips and eases configuration. You can change the display BIOS simply by reprogramming the Flash chip.

Utility disk

The PCM-4862 is supplied with a software utility disk. This disk contains the necessary file for setting up the VGA display and Ethernet controller. Directories and files on the disk are as follows:

```
── README.DOC
── COOKROM.EXE

── DISPLAY (Dir) ──── AWDFLASH.EXE
                    ── 4862_SYS.BIN
                    ── 4862_CRT.BIN
                    ── 4862_TFT.BIN
                    ── 4862_STN.BIN
                    ── 4862_ST5.BIN
                    ── 4862_MON.BIN
                    ── 4862_EL.BIN
                    ── CBROM.EXE
```
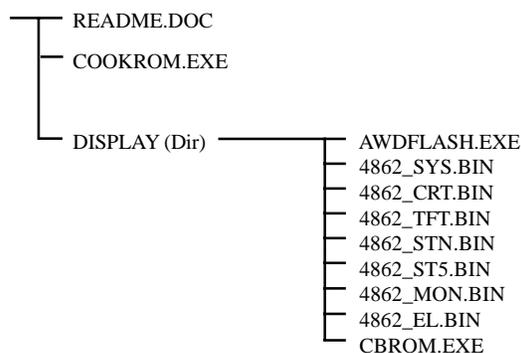
COOKROM.EXE
A program that converts application files into binary files (files with a .BIN extension). These are then written into the SSD Flash ROM devices.

RSET8019.EXE
This program enables you to view the current Ethernet configuration, reconfigure the Ethernet interface (medium type, etc.), and execute useful diagnostic functions.

AWDFLASH.EXE

This program allows you to write the VGA BIOS files to the BIOS
Flash ROM. The VGA files all come ready formatted for the PCM-
4862 with .BIN extensions. See README.DOC. These files
support various CRT and flat panel displays. They are custom
written and can be made available upon request.

4862-SYS.BIN

This binary file contains the system BIOS.

4862-CRT.BIN

Supports CRT only.

4862-TFT.BIN (default)

Supports 640 x 480 18 bit or 24 bit color TFT LCD panel
(Sharp LQ9D011, Toshiba LTM10C042).

4862-STN.BIN (1 MB VRAM)

Supports 640 x 480 color STN DD 8/16-bit displays
(Sharp LM64C142).

4862-ST5.BIN (512 KB VRAM)

Supports 640 x 480 color STN DD 8/16-bit displays
(Sharp LM64C142).

*NOTE: This BIOS does not support simultaneous CRT
          and flat panel display with 512 KB VRAM*

4862-MON.BIN

Supports 640 x 480 dual scan monochrome displays
(Sharp LM64P8X/837).

4862-EL.BIN

Supports 640 x 480 EL displays (PLANAR EL640480 - A Series).

CBROM.EXE

This program allows you to combine your own VGA BIOS with
system BIOS (4862_SYS.BIN).

VGA display software configuration

The PCM-4862's on-board VGA interface supports a wide range of popular LCD, EL, gas plasma flat panel displays and traditional analog CRT monitors. The interface can drive CRT displays with resolutions up to 1024 x 768 in 256 colors. It is also capable of driving color panel displays with resolutions of 640 x 480 in 64K colors. The VGA interface is configured completely via the software utility, so you don't have to set any jumpers. Configure the VGA display as follows:

1. Apply power to the PCM-4862 with a color TFT display attached. This is the default setting for the PCM-4862. Ensure that the AWDFLASH.EXE and *.BIN files are located in the working drive.

NOTE: *Ensure that you do not run AWDFLASH.EXE while your system is operating in EMM386 mode.*

2. At the prompt, type AWDFLASH.EXE and press <Enter>. The VGA configuration program will then display the following:

```
            FLASH  MEMORY  WRITER v1.2
      Copyright (C) 1993, Award Software, Inc.,

           For VIA486A-310L200           08/23/1994
           Flash Type -

    File Name to Program :  ████████████████

    Error Message:
```
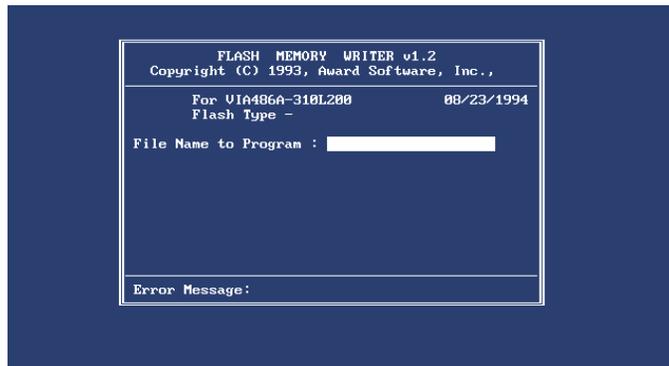
VGA Setup screen

3. At the prompt, type in the BIN file which supports your display.
    When you are sure that you have entered the file name correctly
    press <Enter>. The screen will ask "Do you want to save?" If
    you wish to continue press Y. If you change your mind or have
    made a mistake press N to abort and end the setup procedure.

4. If you decide to continue, the program will create a BIOS.OLD
    file which contains the existing BIOS configuration. The
    prompt will then ask "Are you sure you want to save new
    configuration?" Press Y if you want the new file to be written
    into the BIOS. Press N to exit the program.

The new VGA configuration will then write to the ROM BIOS
chip. This configuration will remain the same until you run the
AWDFLASH.EXE program and change the settings.

Connections for four standard LCDs

Connections to Sharp LM64183P
(640 x 480 DSTN MONO LCD)

LM64P83		PCM-4862 CN2	
Pin	**Pin name**	**Pin**	**Pin name**
CN1-1	S	36	FLM
CN1-2	CP1	38	LP
CN1-3	CP2	35	SHFCLK
CN1-4	DISP	5	+5 V
CN1-5	VDD	6	+5 V
CN1-6	VSS	3	GND
CN1-7	VEE	-	-17 V (external power)
CN1-8	DU0	12	P3
CN1-9	DU1	11	P2
CN1-10	DU2	10	P1
CN1-11	DU3	9	P0
CN1-12	DL0	16	P7
CN1-13	DL1	15	P6
CN1-14	DL2	14	P5
CN1-15	DL3	13	P4

Connections to PLANAR EL
(640 x 480 AD4 EL)

PLANAR 640 x 480 AD4		PCM-4862 CN2	
Pin	Pin name	Pin	Pin name
1	GND	3	GND
2	DO	21	P12
3	GND	3	GND
4	D1	22	P13
5	GND	3	GND
6	D2	23	P14
7	NC	—	—
8	D3	24	P15
9	NC	—	—
10	D4	17	P8
11	NC	—	—
12	D5	18	P9
13	NC	—	—
14	D6	19	P10
15	GND	4	GND
16	D7	20	P11
17	GND	4	GND
18	VCLK	42	ASHFCLK
19	GND	4	GND
20	/BLANK	—	—
21	GND	8	GND
22	HS	37	M
23	NC	—	—
24	VS	36	FLM
25	NC	—	—
26	SELFTST	39	GND
27	COLMAP	39	GND
28	ENABLE	—	—
29	RESERVED	—	—
30	/LOWPOW	—	—
31,32	NC	—	—
33	RESERVED	—	—
34	NC	—	—

Connections to Toshiba LTM09C016 (640 x 480 TFT Color LCD)

LTM09C016		PCM-4862 CN2	
Pin	Pin name	Pin	Pin name
CN1-1	NCLK	35	SHFCLK
CN1-2	GND	3	GND
CN1-3	R0	22	P13
CN1-4	GND	3	GND
CN1-5	R1	23	P14
CN1-6	GND	4	GND
CN1-7	R2	24	P15
CN1-8	GND	4	GND
CN1-9	G0	17	P8
CN1-10	GND	8	GND
CN1-11	G1	18	P9
CN1-12	GND	8	GND
CN1-13	G2	19	P10
CN1-14	GMD	33	GND
CN1-15	NC	—	—
CN2-1	B0	11	P2
CN2-2	GND	33	GND
CN2-3	B1	12	P3
CN2-4	GND	34	GND
CN2-5	B2	13	P4
CN2-6	GND	34	GND
CN2-7	ENAB	37	M
CN2-8	GND	39	GND
CN2-9	VDD	5	+5 V
CN2-10	VDD	6	+5 V

Connections to Sharp LM64C142
(640 x 480 DSTN Color LCD)

LM64C142		PCM-4862 CN2	
Pin	Pin name	Pin	Pin name
CN1-1	YD	36	FLM
CN1-2	LP	38	LP
CN1-3	XCX	35	SHFCLK
CN1-4	DISP	5	+5 V
CN1-5	VDD	6	+5 V
CN1-6	VSS	3	GND
CN1-7	VEE	-	+27 V (external power)
CN1-8	DU0	20	P11
CN1-9	DU1	19	P10
CN1-10	DU2	18	P9
CN1-11	DU3	17	P8
CN1-12	DU4	12	P3
CN1-13	DU5	11	P2
CN1-14	DU6	10	P1
CN1-15	DU7	9	P0
CN2-1	VSS	4	GND
CN2-2	DL0	24	P15
CN2-3	DL1	23	P14
CN2-4	DL2	22	P13
CN2-5	DL3	21	P12
CN2-6	DL4	16	P7
CN2-7	DL5	15	P6
CN2-8	DL6	14	P5
CN2-9	DL7	13	P4
CN2-10	VSS	8	GND

Ethernet software configuration

The PCM-4862's on-board Ethernet interface supports all major network operating systems. I/O addresses and interrupts are easily configured via the RSET8019.EXE program (either by jumperless mode or PNP mode). To execute the configuration, to view the current configuration, or to run diagnostics, do the following:

1. Power the PCM-4862 on. Ensure that the RSET8019.EXE file is located in the working drive.

2. At the prompt type RSET8019.EXE and press <Enter>. The Ethernet configuration program will then be displayed.

3. This simple screen shows all the available options for the Ethernet interface. Just highlight the option you wish to change by using the Up and Down keys. To change a selected item, press <Enter>, and a screen will appear with the available options. Highlight your option and press <Enter>. Each highlighted option has a helpful message guide displayed at the bottom of the screen for additional information.

4. After you have made your selections and your are sure that this is the configuration you want, press ESC. A prompt will appear asking if you want to save the configuration. Press Y if you want to save.

The Ethernet Setup Menu also offers three very useful diagnostic functions. These are:

1. Run EEPROM test

2. Run Diagnostics on Board

3. Run Diagnostics on Network

Each option has its own display screen which shows the format and result of any diagnostic tests undertaken.

CHAPTER

4

Award BIOS Setup

This chapter describes how to set BIOS configuration data.

System test and initialization

These routines test and initialize board hardware. If the routines encounter an error in during the tests, you will either hear a few short beeps or see an error message on the screen. There are two kinds of errors: fatal and non-fatal. The system can usually continue the boot up sequence with non-fatal errors. Non-fatal error messages usually appear on the screen along with the following instructions:

```
press <F1> to RESUME
```

Write down the message and press the F1 key to continue the bootup sequence.

System configuration verification

These routines check the current system configuration against the values stored in the card's CMOS memory. If they don't match, the program outputs an error message. You will then need to run the BIOS setup program to set the configuration information in memory.

There are three situations in which you will need to change the CMOS settings:

1. You are starting your system for the first time

2. You have changed the hardware attached to your system

3. The CMOS memory has lost power and the configuration information has been erased.

The PCM-4862's CMOS memory has an integral lithium battery backup. The battery backup should last ten years in normal service, but when it finally runs down, you will need to replace the complete unit.

AWARD BIOS setup

```
        ROM ISA BIOS (2C4L6AKA)
          CMOS SETUP UTILITY
        AWARD SOFTWARE, INC.

  STANDARD CMOS SETUP          PASSWORD SETTING

  BIOS FEATURES SETUP          IDE HDD AUTO DETECTION

  CHIPSET FEATURES SETUP       SAVE & EXIT SETUP

  POWER MANAGEMENT SETUP       EXIT WITHOUT SAVING

  LOAD BIOS DEFAULTS



  ESC: QUIT                    ←→↑↓: SELECT ITEM

  F10: Save & Exit Setup       (Shift)F2: Change Color

        Time, Date, Hard Disk Type....
```
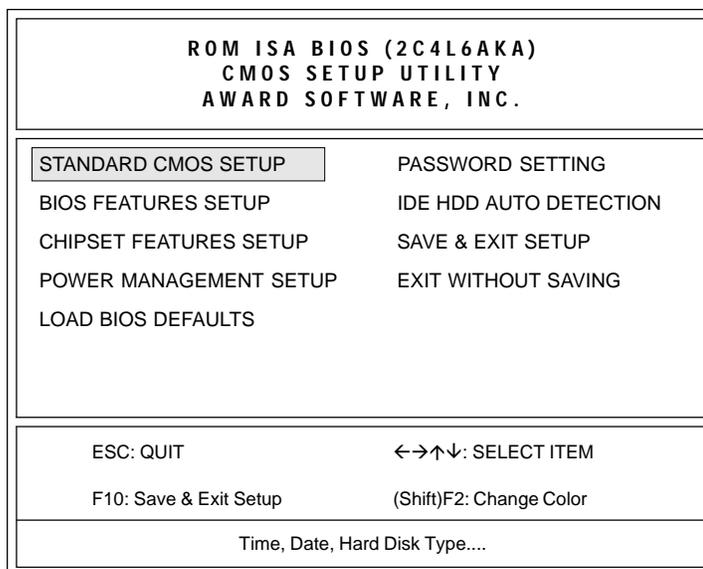
Setup program initial screen

Award's 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 CMOS RAM so that it retains the Setup information when the power is turned off.

Entering setup

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

Standard CMOS setup

When you choose the STANDARD CMOS SETUP option from the INITIAL SETUP SCREEN menu, the screen shown 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. Once a field is highlighted, on-line help information is displayed in the left bottom of the Menu screen.

```
        ROM ISA BIOS (2C4L6AKA)
          STANDARD CMOS SETUP
          AWARD SOFTWARE, INC.

 Date (mm:dd:yy)    :   Wed, Jan 17 1996
 Time (hh:mm:ss)    :    12 : 19 : 58
 HARD DISKS     TYPE  SIZE  CYLS.   HEADS  PRECOMP  LANDZONE  SECTORS  MODE

 Primary Master  none   0     0       0       0        0         0     NORMAL
 Primary Slave   none   0     0       0       0        0         0     N/A
 Secondary Ma.   none   0     0       0       0        0         0     N/A
 Secondary Sl.   none   0     0       0       0        0         0     N/A

 Drive A : None                      Base Memory  :      640K
 Drive B : None                  Extended Memory  :     3072K
                                    Other Memory  :      384K
 Video  : EGA/VGA
 Halt On : All Errors                Total Memory :     4096K

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

CMOS setup screen

BIOS features setup

By choosing the BIOS FEATURES SETUP option from the INITIAL SETUP SCREEN menu, the screen below is displayed. This sample screen contains the manufacturer's default values for the PCM-4862**.**

```
┌────────────────────────────────────────────────────────────────┐
│              ROM ISA BIOS (2C4L6AKA)                           │
│                 BIOS FEATURES SETUP                            │
│                 AWARD SOFTWARE, INC.                           │
├────────────────────────────────────────────────────────────────┤
│ Virus Warning          : Enabled   Video BIOS Shadow   : Enabled   │
│ CPU Internal Cache     : Enabled   C8000-CBFFF Shadow  : Disabled  │
│ External Cache         : Enabled   CC000-CFFFF Shadow  : Disabled  │
│ Quick Power On Self Test : Disabled D0000-D3FFF Shadow  : Disabled  │
│ Boot Sequence          : A,C       D4000-D7FFF Shadow  : Disabled  │
│ Swap Floppy Drive      : Disabled  D8000-DBFFF Shadow  : Disabled  │
│ Boot Up Floppy Seek    : Enabled   DC000-DFFFF Shadow  : Disabled  │
│ Boot Up NumLock Status : On                                        │
│ Boot Up System Speed   : High                                      │
│ IDE HDD Block Mode     : Disabled                                  │
│ Gate A20 Option        : Normal                                    │
│ Memory Parity Check    : Enabled                                   │
│ Typematic Rate Setting : Disabled  Esc : Quit        ←→↑↓:Select Item│
│ Typematic Rate (Chars/Sec) : 6     F1  : Help      PU/PD/+/-:Modify │
│ Typematic Delay (Msec) : 250       F5  : Old Values  (Shift)F2 : Color│
│ Security Option        : Setup     F6  : Load BIOS Defaults         │
└────────────────────────────────────────────────────────────────┘
```

BIOS features setup

CHIPSET features setup

By choosing the CHIPSET FEATURES SETUP option from the INITIAL SETUP SCREEN menu, the screen below is displayed. This sample screen contains the manufacturer's default values for the PCM-4862.

```
        ROM ISA BIOS (2C4L6AKA)
           CMOS SETUP UTILITY
         CHIPSET FEATURES SETUP

Auto Configuration      : Enabled      On-Board Local-Bus IDE    : Enabled
Decoupled Refresh       : Disabled     IDEPrimary Master PIO     : Auto
Relocate 256K/384K      : Disabled     IDE Primary Slave PIO     : Auto
Video BIOS Cacheable    : Enabled
System BIOS Cacheable   : Enabled      On-Board FDC Controller   : Enabled
                                       On-Board Serial Port 1    : COM1
External Cache Scheme    : Write Back  On-Board Serial Port 2    : COM2
Combine Alter & Tag Bits : Disabled    COM3 & COM4 Address       : 3E8H,2E8H
CHRDY for ISA Master     : Enabled     On-Board Parallel Port    : 278H
Memory Hole At 15 MB Addr. : Disabled  Parallel Extended Mode    : Standard
Cache Timing Control     : Fast
DRAM Timing Control      : Normal      Solid State Disk          : Disabled
Fast DRAM                : Disabled
Burst Write              : Disabled    ─────────────────────────────────────
CPU Write Back Cache     : Disabled    Esc : Quit            ←→↑↓: Select Item
Set Turbo Pin Function   : Suspend     F1  : Help            PU/PD/+/- : Modify
Set Mouse Lock           : Disabled    F5  : Old Values      (Shift)F2 : Color
                                       F6  : Load BIOS Defaults
```

CHIPSET features setup

Power management setup

By choosing the POWER MANAGEMENT SETUP option from the INITIAL SETUP SCREEN menu, the screen below is displayed. This sample screen contains the manufacturer's default values for the PCM-4862.

```
ROM ISA BIOS (2C4L6AKA)
CMOS SETUP UTILITY
POWER MANAGEMENT SETUP

Power Management      : Disabled      IRQ3 Activity        : Primary
Doze Mode             : 8 sec         IRQ4 Activity        : Primary
                                      IRQ5 Activity        : Primary
Sleep Timer           : 2 min         IRQ7 Activity        : Primary
Sleep Mode            : Suspend       IRQ8 Activity        : Secondary
HDD Power Management   : 1 min         IRQ10 Activity       : Primary
VGA Activity Wakeup   : Disabled      IRQ11 Activity       : Primary
                                      IRQ12 Activity       : Primary
IO Activity           : Disabled


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

Power management setup

Load BIOS defaults

LOAD BIOS DEFAULTS loads the default system values directly from ROM. If the stored record created by the Setup program becomes corrupted (and therefore unusable), these defaults will load automatically when you turn the PCM-4862 on.

```
┌─────────────────────────────────────────────────────────────┐
│            ROM ISA BIOS (2C4L6AKA)                          │
│              CMOS SETUP UTILITY                              │
│             AWARD SOFTWARE, INC.                            │
├─────────────────────────────────────────────────────────────┤
│                                                             │
│  STANDARD CMOS SETUP          PASSWORD SETTING              │
│                                                             │
│  BIOS FEATURES SETUP          IDE HDD AUTO DETECTION        │
│                                                             │
│  CHIPSET FEATURES SETUP       SAVE & EXIT SETUP             │
│                                                             │
│  POWER MANAGEMENT SETUP       EXIT WITHOUT SAVING           │
│                                                             │
│  LOAD BIOS DEFAULTS                                         │
│               ┌──────────────────────────────┐            │
│               │  Load BIOS Defaults (Y/N)? Y  │            │
│               └──────────────────────────────┘            │
│                                                             │
├─────────────────────────────────────────────────────────────┤
│                                                             │
│   ESC: QUIT              ←→↑↓:SELECT ITEM                   │
│                                                             │
│   F10:Save & Exit Setup  (Shift)F2:Change Color            │
├─────────────────────────────────────────────────────────────┤
│    Load BIOS defaults except standard CMOS SETUP           │
└─────────────────────────────────────────────────────────────┘
```

Load BIOS defaults screen

Change password

To change the password, choose the PASSWORD SETTING option form the Setup main menu and press <Enter>.

1. If the CMOS is bad or this option has never been used, there is default password which is stored in the ROM. The screen will display the following messages:

Enter Password:

Press <Enter>.

2. If the CMOS is good or this option has been used to change the default password, the user is asked for the password stored in the CMOS. The screen will display thefollowing message:

Confirm Password:

Enter the current password and press <Enter>.

3. After pressing <Enter> (ROM password) or the current password (user-defined), you can change the password stored in the CMOS. The password can be at most 8 characters long.

Remember - to enable this feature, you must first select either Setup or System in the BIOS FEATURES SETUP.

Auto detect hard disk

The IDE HDD AUTO DETECTION utility can automatically detect the IDE hard disk installed in your system. You can use it to self-detect and/or correct the hard disk type configuration.

```
┌─────────────────────────────────────────────────────────────────┐
│                  ROM ISA BIOS (2C4L6AKA)                          │
│                  CMOS SETUP UTILITY                               │
│                  AWARD SOFTWARE, INC.                            │
├─────────────────────────────────────────────────────────────────┤
│                                                                   │
│                                                                   │
│ HARD DISK TYPE    SIZE   CYLS.   HEADS    PRECOMP   LANDZ   SECTORS MODE │
│ Drive C        :  (MB)   790     15       65535     789     57     │
│    ┌──────────────────────────────────────────────────────┐      │
│    │     Select Secondry Slave Option (N=Skip) : N         │      │
│    │  ─────────────────────────────────────────────────    │      │
│    │                                                        │      │
│    └──────────────────────────────────────────────────────┘      │
│                        ESC = SKIP                                 │
└─────────────────────────────────────────────────────────────────┘
```

IDE HDD auto detection screen

Save & exit setup

If you select this option and press <Enter>, the values entered in the setup utilities will be recorded in the chipset's CMOS memory. 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.

Exit without saving

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

SVGA Setup

The PCM-4862 features an on-board flat panel/VGA interface. This chapter provides instructions for installing and operating the software drivers on the included display driver diskette.

Simultaneous display mode

The 65545 VGA BIOS supports monochrome LCD, EL, color TFT and STN LCD flat panel displays. It also supports interlaced and non-interlaced analog monitors (VGA color and VGA monochrome) 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 supported as analog monitors.

Both CRT and panel displays can be used simultaneously. The PCM-4862 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. In the utility diskette, there are three .COM files which can be used to select the display. Simply type the filename at the DOS prompt:

CT.COM   Enables CRT display only

FP.COM   Enables panel display only

SM.COM   Enables both displays at the same time.

Sleep mode

The display driver diskette contains two files that support sleep mode. Simply type the filename at the DOS prompt:

ON.COM switches to normal display mode.

OFF.COM switches to sleep mode.

Software support

The drivers support the following applications using the filenames and resolutions listed:

Application	Filename	Resolution	Colors
Windows 3.1	LINEAR4.DRV	640x480	16
		800x600	16
		1024x768	16
	LINEAR8.DRV	640x480	256
		800x600	256
		1024x768	256
	LINEAR16.DRV	640x480	64K
	LINEAR24.DRV	640x480	16M
AutoCAD R12	RCTURBOC.EXP	640x480	16
		800x600	16
		1024x768	16
		640x480	256
		800x600	256
		1024x768	256
		640x480	32K
		640x480	64K
		640x480	16M
Lotus 1-2-3 2.0 and Lotus Symphony 1.0,1.1			
	V132X25.DRV	132x25 (Text)	16
	V132X50.DRV	132x50 (Text)	16
VESA 1.2	VESA.COM	800x600	16
		1024x768	16
		640x400	256
		640x480	256
		800x600	256
		1024x768	256
		640x480	32K
		640x480	64K

Word 5.0	VGA600.VID	800x600	16
	VGA768.VID	1024x768	16
Word 5.5	VGA55600.VID	800x600	16
	VGA55768.VID	1024x768	16
WordPerfect 5.0	CHIPS600.WPD	800x600	16
	CHIPS768.WPD	1024x768	16
WordPerfect 5.1	VGA600.VRS	800x600	16
	VGA768.VRS	1024x768	16

Driver installation

Necessary prerequisites

The instructions in this manual assume that you understand elementary concepts of MS-DOS and the IBM Personal Computer. Before you attempt to install any driver or utility you should: know how to copy files from a floppy disk to a directory on the hard disk, understand the MS-DOS directory structure, and know how to format a floppy disk. If you are uncertain about any of these concepts, please refer to the DOS or Windows user reference guides for more information before you proceed with the installation.

Before you begin

Before you begin installing software drivers, you should make a backup copy of the display driver diskette and store the original in a safe place. The display driver diskette contains drivers for several versions of certain applications. You must install the correct version in order for the driver to work properly so make sure you know which version of the application you have.

Windows setup

These drivers are designed to work with Microsoft Windows 3.1. You may install these drivers through Windows or in DOS.

Step 1: Install Windows as you normally would for a VGA display. Run Windows to make sure that it is working correctly.

Step 2: Place the display driver diskette in drive A. In Windows Program Manager, choose *File* from the Options Menu. Then from the pull-down menu, choose *Run . . . .* At the command line prompt, type **A:\WINSETUP**. Press the <ENTER> key or click *OK* to begin the installation. At this point the setup program locates the directory where Windows is installed. For proper operation, the drivers must be installed in the Windows subdirectory. Press <ENTER> to complete the installation. Once completed, the Display Driver Control Panel appears on the screen. This Control Panel allows you to select and load the installed drivers.

Another method of installing these drivers is through the File Manager. Click on *Drive A:*. Then double-click on *WINSETUP.EXE* to begin installation.

Changing Display Drivers in Windows

To change display drivers in Windows, select the *Windows Setup* icon from the Main window. You will be shown the current setup configuration. Select *Change System Settings* from the Option menu. Click on the arrow at the end of the Display line. You will be shown a list of display drivers. Click on the driver you want. Then click on the *OK* button. Follow the directions to complete the setup.

Changing Color Schemes

After you change display drivers, you may notice that the color scheme used by Windows looks strange. This is because different drivers have different default colors. To change the color scheme, select the *Control Panel* from the Main window. Select the *Color* icon. You will be shown the current color scheme. Choose a new color scheme and click the *OK* button.

DOS Setup

Step 1: Install Windows as you normally would for a VGA display. Run Windows to make sure that it is working correctly. Then exit Windows.

Step 2: Place the display driver diskette in drive A. Type **A:** <ENTER> to make this the default drive. Type **SETUP** <ENTER> to run the driver SETUP program. Press any key to get to the applications list. Using the arrow keys, select *Windows Version 3.1* and press the <ENTER> key. Press the <ENTER> key to select *All Resolutions*, and then press <END> to begin the installation. At this point you will be asked for the path to your Windows System directory (default C:\WINDOWS). When the installation is complete, press any key to continue. Press <ESC> followed by Y to exit to DOS.

Step 3: Change to the directory where you installed Windows (usually C:\WINDOWS).

Step 4: Type **SETUP** <ENTER> to run the Windows Setup program. It will show the current Windows configuration. Use the up arrow key to move to the Display line and press <ENTER>. A list of display drivers will be shown. Use the arrow keys to select one of the drivers starting with an asterisk (*) and press <EN-TER>.

Step 5: Follow the directions on the screen to complete the setup. In most cases, you may press <ENTER> to accept the suggested option. When Setup is done, it will return to DOS. Type **WIN** <ENTER> to start Windows with the new display driver.

Changing Display Drivers in DOS

To change display drivers from DOS, change to the Windows directory and run Setup, repeating steps 4 and 5 from the previous page. Besides the special display drivers marked by an asterisk (*), you should be able to use the following standard drivers:

VGA   640x480, 16 colors

Super VGA   800x600, 16 colors

Panning Drivers

Special panning drivers are provided to allow high-resolution modes to be displayed on a flat panel or CRT. These drivers will show a section of a larger screen and will automatically pan, or scroll, the screen horizontally and vertically when the mouse reaches the edge of the display.

Linear Acceleration Drivers

A special high-performance linear acceleration driver is provided for 256-color modes. This driver may require special hardware and may not be supported on all systems. It is only available for Windows3.1.

AutoCAD R12

These drivers are designed to work with Autodesk AutoCAD R12. They conform to the Autodesk Device Interface (ADI) for Rendering drivers and Display drivers. These display list drivers accelerate redraw, pan, and zoom functions.

Driver installation
Step 1: Place the display driver diskette in drive A. Type **A:** <ENTER> to make this the default drive. Type **SETUP** <ENTER> to run the SETUP program. Press any key to get to the applications list. Using the arrow keys, select *AutoCAD Release 12* and press <ENTER>. This will display a list of supported driver resolutions. Using the arrow keys and the <ENTER> key, select the resolutions that are appropriate for your monitor. When all of the desired resolutions have been selected, press <END> to begin the installation. At this point you will be asked for a drive and directory to copy the driver files. Enter the drive and directory that contains the installed AutoCAD R12. If the destination directory does not exist you will be asked for confirmation. When the installation is complete, press any key to continue. Press <ESC> followed by Y to exit to DOS.

Step 2: Go to the AutoCAD directory where the new drivers were installed and run the driver installation program by typing **ACAD12 -r** <ENTER>. This program will configure your AutoCAD R12 to use the new display drivers. Select *TurboDLD Classic*.

Configuring TurboDLD
Select *Configure Video Display*. In Display Device Configuration choose *Select Graphics Board/Resolution*. Then choose *Select Display Graphics Board*. After choosing a graphics board, go to *Select Display Resolution*. After selecting the display resolution, save the new configuration, and return to the main menu.

Basic Configuration Menu

This menu allows you to modify:

Number of AutoCAD Command Lines

Font Size   6x8/8x8/8x14/8x16/12x20/12x24

Dual Screen   Enable/Disable

User Interface Configuration

Double Click Interval Time

BP Button

BP Highlight   Patt Line/Xor Rect/Both

BP Refresh   Enable/Disable

BP Cache   Enable/Disable

Expert Configuration Menu

This menu allows you to modify:

Display List   Enable/Disable

Drawing Cache   Enable/Disable

Use Acad 31 bit space?   Yes/No

Internal Command Echo   Enable/Disable

BP Zoom Mode   Freeze/Float

Regen Mode   Incremental/Fast

If your previously installed driver is not TurboDLD, you will have
to reconfigure the RENDER command the first time you use it.

Lotus 1-2-3 and Lotus Symphony

These drivers are designed to work with Lotus 1-2-3 versions 2.0, 2.01 and 2.2, and with Lotus Symphony versions 1.0 and 1.1.

Driver installation

Step 1: Place the display driver diskette into drive A. Make A the default drive by typing **A:** <ENTER>. Run the SETUP program by typing **SETUP** <ENTER>. Press any key to display a list of supported applications. Use the arrow keys to select *Lotus/ Symphony,* and press <ENTER>. A list of supported screen resolutions will be displayed. Use the arrow keys to select the desired screen resolution and press <ENTER>. (Make sure your monitor is able to display the resolution desired) Press <END> to begin the driver installation process. A default drive and directory path will be displayed. Use the backspace key to erase this default and type in the 123 directory. At this point you may be asked to create the target directory if it does not already exist. After the files have been installed, press any key to return to the list of supported applications. Press <ESC> followed by Y to exit to DOS. Copy all the files that were just created in the temporary directory onto a formatted floppy diskette.

Step 2: Go to your 123 directory, and start the installation program. Type the following commands:

  C: <ENTER>

  INSTALL <ENTER>

Step 3: The Lotus installation program will load and present the installation menu. From this menu, select *Advanced Options*. From the Advanced Options menu, select *Add New Drivers To Library*. From the Add New Drivers Menu, select *Modify Current Driver Set*. From the Modify Driver Set Menu, select *Text Display*. From the Text Display menu, select one of drivers.

Step 4: After the selection of the appropriate VGA display driver, you will need to exit this menu and return to the Main Lotus Installation Menu. Do this by selecting *Return To Menu*.

Step 5: At the Main Lotus Installation Menu, select *Save Changes*.

Step 6: At this point the Installation Menu will prompt you for the name of your new Lotus configuration file. The Lotus system will prompt you with the default value — 123.SET, but you may want to use a filename that indicates the resolution of its driver. For example, if you installed the 132 column by 25 line driver, you could name this driver 132X25.SET, or if you installed the 80 by 50 driver, you may want to call the file 80X50.SET.

Step 7: The installation of your Lotus 1-2-3 driver is now complete. You will need to exit the Lotus installation program at this point. At the main Lotus Installation Menu, select ***Exit***.

NOTE: If your driver set is not 123.SET, you have to type the filename of your driver set in the command line when you start Lotus 1-2-3. For example, if you named your driver set 132X25.SET, type the following to start Lotus 1-2-3:

   123 132X25.SET <ENTER>

VESA

The Video Electronics Standards Association (VESA) has created a standard for a Super VGA BIOS Extension (VBE). This defines a standard software interface to allow application programs to set and control extended video modes, such as 800x600 graphics, on video adapters from different manufacturers.

The VESA driver adds this Super VGA BIOS Extension to the VGA BIOS. Any application program which supports the VESA standard driver interface can be used with this driver. This VESA driver conforms to the VESA Super VGA Standard #VS891001.

Driver installation
Step 1: Place the display driver diskette into drive A. Make A the default drive by typing **A:** <ENTER>. Run the SETUP program by typing **SETUP** <ENTER>. Press any key to display a list of supported applications. Use the arrow keys to select VESA Driver *Version 1.2* and press <ENTER>. Press the <ENTER> key to select *All Resolutions*, and press <END> to begin the installation. A default drive and directory path will be displayed. Use the backspace key to erase this and type in a directory that is in the directory path (such as C:\BIN or C:\UTILS). After the files have been installed, press any key to return to the list of supported applications. Press <ESC> followed by Y to exit to DOS.

Step 2: To install the VESA driver, type either **VESA** <ENTER> or **VESA** + <ENTER> at the DOS prompt. The optional + command line parameter enables all of the available modes. Make sure that your monitor is capable of displaying these high resolution modes before enabling them.

NOTE: If the video BIOS already supports VBE extended video modes, DO NOT use this driver. Run the VTEST.EXE program to see if the video BIOS supports the VBE modes.

Word

These drivers are designed to work with Microsoft Word 5.0 and 5.5.

Driver installation
If you have already installed Word on your computer, go to Step 2 to install the new video driver.

Step 1: Install Word as normal.

Step 2: After you complete the Word installation, place the display driver diskette into drive A. Make A the default drive by typing **A:** <ENTER>. Run the SETUP program by typing **SETUP** <EN-TER>. Press any key to display a list of supported applications. Use the arrow keys to select *Word* and press <ENTER>. Use the arrow keys to select the desired screen resolution and press <ENTER> (make sure your monitor is able to display the resolution desired). Press <END> to begin the driver installation process. A default drive and directory path will be displayed. Use the backspace key to erase this and type in your Word directory. After the files have been installed, press any key to return to the list of supported applications. Press <ESC> followed by Y to exit to DOS.

Step 3: Copy the driver file for the desired resolution that was just installed to SCREEN.VID.

WordPerfect

These drivers are designed to work with WordPerfect 5.0 or 5.1. They support 132-column display in editing mode, and high-resolution graphics display in PreView mode.

Driver installation

Step 1: Place the display driver diskette into drive A. Make A the default drive by typing **A:** <ENTER>. Run the SETUP program by typing **SETUP** <ENTER>. Press any key to display a list of supported applications. Use the arrow keys to select *WordPerfect* and press <ENTER>. A list of supported screen resolutions will be displayed. Use the arrow keys to select the desired screen resolution and press <ENTER> (make sure your monitor is able to display the resolution desired). Press <END> to begin the driver installation process. A default drive and directory path will be displayed. Use the backspace key to erase this default and type in the WordPerfect directory. At this point you may be asked to create the target directory if it does not already exist. After the files have been installed, press any key to return to the list of supported applications. Press <ESC> followed by Y to exit to DOS.

Step 2: Start WordPerfect, and press <SHIFT>+<F1> to enter the setup menu. Select *D* for Display and *G* for Graphics Screen Type, and then choose the desired Chips VGA resolution.

Configuring WordPerfect 5.0 for 132 columns

Follow these instructions to configure WordPerfect 5.0 for 132 column text mode:

Step 1: To use the SETCOL program to set 132 columns and 25 rows, type the following command:

SETCOL 132, 25 <ENTER>

Step 2: Start WordPerfect. The program will detect the number of rows and columns automatically. If for some reason WordPerfect is unable to adapt to 132 columns by 25 rows, start WordPerfect with the following command:

WP /SS=25,132 <ENTER>

Configuring WordPerfect 5.1 for 132 columns

Start WordPerfect and press <SHIFT>+<F1> to enter the setup menu. Select *D* for Display and *T* for Text Screen Type and then select *Chips 132 Column Text*.

Programming the Watchdog Timer

The PCM-4862 is equipped with a watchdog timer that resets the CPU or generates an interrupt if processing comes to a standstill for whatever reason. This feature ensures system reliability in industrial standalone, or unmanned, environments.

Jumpers J23 and J24 control the watchdog settings. The default configuration of the timer is enabled with system reset.

To enable the watchdog timer, you must write a program which reads I/O port address 443 (hex) at regular intervals. The first time your program reads the port, it enables the watchdog timer. After that, your program must read the port at time interval of less than 1.6 seconds, otherwise the watchdog timer will activate and reset the CPU or generate an interrupt on IRQ15. When you want to disable the watchdog timer, your program should read I/O port 043 (hex).

If CPU processing comes to a standstill because of EMI or a software bug, your program's signals to I/O port address 443 to the timer will be interrupted. The timer will then automatically reset the CPU or invoke an IRQ, and data processing will continue normally.

You must write your program so that it reads I/O port address 443 at an interval shorter than the timer's preset interval. The timer's intervals have a tolerance of ±30%, so you should program an instruction that will refresh the timer about every second.

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

```
10      REM  Watchdog timer example program
20      X=INP (&H443) REM  Enable and refresh the watchdog
30      GOSUB 1000 REM  Task #1, takes 1 second to complete
40      X=INP (&H443) REM  Refresh the watchdog
50      GOSUB 2000 REM  Task #2, takes 1 second to complete
60      X=INP (&H043) REM  Disable the watchdog
70      END
1000    REM  Subroutine #1, takes 1 second to complete
        .
        .
        .
1070    RETURN
2000    REM  Subroutine #2, takes 1 second to complete
        .
        .
        .
2090    RETURN
```

APPENDIX

B

Installing PC/104 Modules

This appendix gives instructions for installing PC/104 modules.

Installing PC/104 modules

The PCM-4862's PC/104 connectors give you the flexibility to attach PC/104 expansion modules. These modules perform the functions of traditional plug-in expansion cards, but save space and valuable slots. Modules include:

- **PCM-3290**　　GPS Module
- **PCM-3810**　　Solid State Disk Module
- **PCM-3820**　　High Density Flash Disk Module
- **PCM-3110**　　PCMCIA Module
- **PCM-3111**　　Secondary PCMCIA Module
- **PCM-3610**　　Isolated RS-232 and RS-422/485 Module
- **PCM-3660**　　Ethernet Module
- **PCM-3718**　　30 KHz A/D Module
- **PCM-3724**　　48-Channel DIO Module
- **PCM-3640**　　4-Port RS-232 Module
- **PCM-3680**　　Dual Port CAN Module

Installing these modules on the PCM-4862 is quick and simple. The following steps show how to mount the PC/104 modules:

1. Remove the PCM-4862 from your system paying particular attention to the safety instructions already mentioned above.

2. Make any jumper or link changes required to the CPU card now. Once the PC/104 module is mounted you may have difficulty in accessing these.

3. Normal PC/104 modules have male connectors and mount directly onto the main card. However, to ensure better bus matching, the connectors on the PCM-4862 and the PC/104 module are both female. For this reason, you may need to use the "male-male" adapter included with the PCM-4862 in order to properly connect your PC/104 module. (Refer to the diagram on the following page.)

4. Mount the PC/104 module onto the CPU card by pressing the module firmly but carefully onto the mounting connectors.

5. Secure the PC/104 module onto the CPU card using the four mounting spacers and srews.
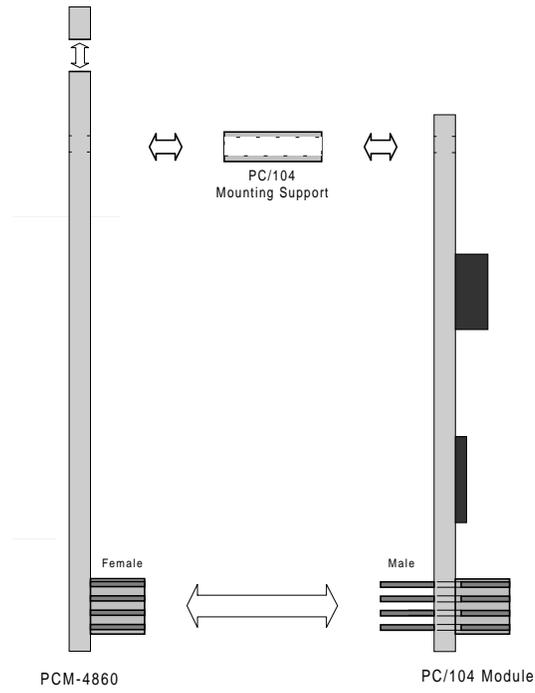
PC/104 Module Mounting Diagram
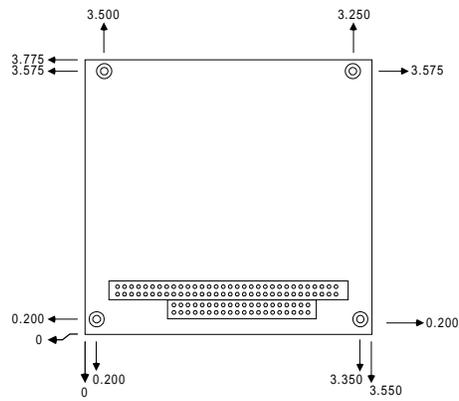
PC/104 module dimensions (inches ±5 %)

Pin Assignments

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

- CRT display connector
- Flat panel display connector
- PC/104 connector
- Front panel connector
- Main power connector
- 10BASE-2/10BASE-5 AUI connector
- RS-232/422/485 serial port connector
- Keyboard and mouse connector
- 10BASE-T connector
- Peripheral power connector
- IDE connector
- RS-232 serial port connector
- CPU fan power connector
- Floppy drive connector
- Printer/parallel port connector

CRT display connector (CN1)

Pin	Signal	Pin	Signal
	PCM-4862 CRT display connector		
1	RED	9	SIGNAL GND
2	N/C	10	H-SYNC
3	GREEN	11	CHASSIS GND
4	SIGNAL GND	12	V-SYNC
5	BLUE	13	CHASSIS GND
6	N/C	14	N/C
7	N/C	15	CHASSIS GND
8	N/C	16	N/C

Flat panel display connector (CN2)

Pin	Function	Pin	Function
	PCM-4862 Flat panel display connector		
1	+12 V	2	+12 V
3	GND	4	GND
5	Vcc	6	Vcc
7	ENAVEE•	8	GND
9	P0	10	P1
11	P2	12	P3
13	P4	14	P5
15	P6	16	P7
17	P8	18	P9
19	P10	20	P11
21	P12	22	P13
23	P14	24	P15
25	P16	26	P17
27	P18	28	P19
29	P20	30	P21
31	P22	32	P23
33	GND	34	GND
35	SHFCLK	36	FLM
37	M	38	LP
39	GND	40	ENABKL
41	GND	42	ASHFCLK
43	Vcc	44	Vcc

PC/104 connectors (CN3, CN5)

Pin Number	Signal (CN3) RowA	RowB	Signal (CN5) RowA	RowB
0	—	—	0V	0V
1	IOCHCHK	0V	SBHE	MEMCS16
2	SD7	RESETDRV	LA23	IOCS16
3	SD6	+5V	LA22	IRQ10
4	SD5	IRQ9	LA21	IRQ11
5	SD4	-5V	LA20	IRQ12
6	SD3	DRQ2	LA19	IRQ15
7	SD2	-12V	LA18	IRQ14
8	SD1	ENDXFR	LA17	DACK0
9	SD0	+12	MEMR	DRQ0
10	IOCHRDY	(KEY)	MEMW	DACK5
11	AEN	SMEMW	SD8	DRQ5
12	SA19	SMEMR	SD9	DACK6
13	SA18	IOW	SD10	DRQ6
14	SA17	IOR	SD11	DACK7
15	SA16	DACK3	SD12	DRQ7
16	SA15	DRQ3	SD13	+5V
17	SA14	DACK1	SD14	MASTER
18	SA13	DRQ1	SD15	0V
19	SA12	REFRESH	(KEY)	0V
20	SA11	SYSCLK	—	—
21	SA10	IRQ7	—	—
22	SA9	IRQ6	—	—
23	SA8	IRQ5	—	—
24	SA7	IRQ4	—	—
25	SA6	IRQ3	—	—
26	SA5	DACK2	—	—
27	SA4	TC	—	—
28	SA3	BALE	—	—
29	SA2	+5V	—	—
30	SA1	OSC	—	—
31	SA0	0V	—	—
32	0V	0V	—	—

PCM-4862 PC/104 connectors

Front panel connector (CN4)

Pin	Signal
PCM-4862 Front panel connector	
1	HDD LED- (HARD DISK ACTIVE)
2	HDD LED+ (V_{cc})
3	SPEAKER+
4	SPEAKER- (GND)
5	GND
6	WATCHDOG TIMER OUT
7	RESET SWITCH- (GND)
8	RESET SWITCH+

Peripheral power connector (CN6)

Pin	Function
PCM-4862 Peripheral power connector	
1	GND
2	-5 V
3	GND
4	-12 V

10BASE-2/10BASE-5 AUI connector (CN7)

Pin	Signal
PCM-4862 Ethernet 10BASE-2/10BASE-5 AUI connector	
1	GND
2	CD-
3	CD+
4	Tx-
5	Tx+
6	GND
7	GND
8	Rx-
9	Rx+
10	+12 V
11	GND
12	GND

PCM-4862 Ethernet 10BASE-2/10BASE-5 AUI connector	
Pin	**Signal**
13	N/C
14	N/C
15	N/C
16	+5 V

COM2 RS-232/422/485 serial port (CN8)

PCM-4862 COM2 RS-232/422/485 serial port	
Pin	**Signal**
1	DCD
2	DSR
3	RxD
4	RTS
5	TxD
6	CTS
7	DTR
8	RI
9	GND
10	N/C
11	485 TxD+
12	485 TxD-
13	485 RxD+
14	485 RxD-

Keyboard and mouse connector (CN9)

PCM-4862 Keyboard and mouse connector	
Pin	**Signal**
1	GND
2	MS V_{cc}
3	MS DATA
4	MS CLOCK
5	GND
6	KB V_{cc}
7	KB DATA
8	KB CLOCK

Ethernet 10BASE-T connector (CN10)

Pin	Signal
PCM-4862 Ethernet 10BASE-T connector	
Pin	Signal
1	V_{CC}
2	CRS LED
3	RCV+
4	RCV-
5	BNC LED
6	GND
7	N/C
8	GND
9	XMT+
10	XMT-

Main power connector (CN11)

Pin	Signal
PCM-4862 Main power connector	
Pin	Signal
1	+12 V
2	GND
3	GND
4	+5 V

IDE hard drive connector (CN12)

PCM-4862 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	SIGNAL GND	20	N/C

PCM-4862 IDE hard drive connector, cont.			
Pin	Signal	Pin	Signal
21	N/C	22	GND
23	IO WRITE	24	GND
25	IO READ	26	GND
27	IO CHANNEL READY	28	N/C
29	N/C	30	GND
31	IRQ14	32	IOCS16
33	ADDR 1	34	N/C
35	ADDR 0	36	ADDR 2
37	HARD DISK SELECT 0	38	HARD DISK SELECT 1
39	IDE ACTIVE	40	MGND
41	VCC	42	MVCC
43	GND	44	N/C

COM1 RS-232 serial port (CN13)

PCM-4862 COM1 RS-232 serial port	
Pin	Signal
1	DCD
2	DSR
3	RxD
4	RTS
5	TxD
6	CTS
7	DTR
8	RI
9	GND
10	N/C

Fan power connector (CN14)

PCM-4862 Fan power connector	
Pin	Signal
1	+5 V
2	GND
3	+12 V

Floppy drive connector (CN15)

PCM-4862 Floppy drive connector			
Pin	**Signal**	**Pin**	**Signal**
1	GND	2	DENSITY SELECT
3	GND	4	N/C
5	GND	6	DRIVE TYPE
7	GND	8	INDEX
9	GND	10	MOTOR 0
11	GND	12	DRIVE SELECT 1
13	GND	14	DRIVE SELECT 2
15	GND	16	MOTOR 1
17	GND	18	DIRECTION
19	GND	20	STEP
21	GND	22	WRITE DATA
23	GND	24	WRITE GATE
25	GND	26	TRACK 0
27	GND	28	WRITE PROTECT
29	GND	30	READ DATA
31	GND	32	HEAD SELECT
33	GND	34	DISK CHANGE

Parallel port connector (CN16)

Pin	Signal
PCM-4862 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	N/C

APPENDIX **D**

Optional Extras

PCM-10586-1 Cable kit for PCM-4862/5860

The PCM-4862 requires several cables for normal operation. You can make them yourself or purchase an optional cable kit assembly which includes the following:

Part No.	Cable description	PCM-5860 connector	Termination connector
1701440350	2.5" and 1.8" IDE	CN12	44-pin, 2 mm, female IDC (350 mm)
1701440500	3.5" IDE (40P)	CN12	40-pin, 2.54 mm, female IDC (500 mm)
1701340700	Dual floppy, 3.5" and 5.25" (34P)	CN15	34-pin dual floppy
1701100300	Primary serial (COM1) RS-232	CN13	9-pin male DSUB
1701140200	Secondary serial (COM2) RS-232/422/485	CN8	9-pin male DSUB * 2
1709612600	Parallel port	CN16	25-pin female DSUB
1701100200	Network 10BASE-T	CN10	RJ-45 8-pin modular jack
1701150150	VGA CRT	CN1	15-pin DSUB
1700060200	Keyboard and PS/2 mouse	CN9	5-pin circular DIN 6-pin circular DIN
1703040301	Peripheral power (-5 V, -12 V)	CN6	4-conductor type
1701440300	LCD cable	CN2	44-pin, 2 mm, 300 mm
1701080300	Front panel	CN4	8-conductor pigtail

PCM-20486-1 Boot ROM binary files for PCM-4860/4862

Boot ROM binary files required for network remote boot-up are available. Please contact your sales rep for detailed information.