PCM-5896

Rev. C

All-in-One Single Board Computer with LCD, Ethernet, Audio, & 4 COMs

FCC STATEMENT

THIS DEVICE COMPLIES WITH PART 15 FCC RULES. OPERATION IS SUBJECT TO THE FOLLOWING TWO CONDITIONS: (1) THIS DEVICE MAY NOT CAUSE HARMFUL INTERFERENCE. (2) THIS DEVICE MUST ACCEPT ANY INTERFERENCE RECEIVED INCLUDING INTERFERENCE THAT MAY CAUSE UNDESIRED OPERATION.

THIS EQUIPMENT HAS BEEN TESTED AND FOUND TO COMPLY WITH THE LIMITS FOR A CLASS "A" DIGITAL DEVICE, PURSUANT TO PART 15 OF THE FCC RULES. THESE LIMITS ARE DESIGNED TO PROVIDE REASONABLE PROTECTION AGAINTST HARMFUL INTERFERENCE WHEN THE EQUIPMENT IS OPERATED IN A COMMERCIAL ENVIRONMENT. THIS EQUIPMENT GENERATES, USES, AND CAN RADIATE RADIO FREQUENCY ENERGY AND, IF NOT INSTATLLED AND USED IN ACCORDANCE WITH THE INSTRUCTION MANUAL, MAY CAUSE HARMFUL INTERFERENCE TO RADIO COMMUNICATIONS. OPERATION OF THIS EQUIPMENT IN A RESIDENTIAL AREA IS LIKELY TO CAUSE HARMFUL INTERFERENCE IN WHICH CASE THE USER WILL BE REQUIRED TO CORRECT THE INTERFERENCE AT HIS OWN EXPENSE.

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Manual PCM-5896 8th Edition

Prepared in Taiwan September 2002

A Message to the Customer

AAEON Customer Services

Each and every AAEON product is built to the most exacting specifications to ensure reliable performance in the harsh and demanding conditions typical of industrial environments. Whether your new AAEON equipment is destined for the laboratory or the factory floor, you can be assured that your product will provide the reliability and ease of operation for which the name AAEON has come to be known.

Your satisfaction is our primary concern. Here is a guide to AAEON customer services. To ensure you get the full benefit of our services, please follow the instructions below carefully.

Technical Support

We want you to get the maximum performance from your products. So if you run into technical difficulties, we are here to help. For the most frequently asked questions, you can easily find answers in your product documentation. These answers are normally a lot more detailed than the ones we can give over the phone.

So please consult this manual first. If you still cannot find the answer, gather all the information or questions that apply to your problem, and with the product close at hand, call your dealer. Our dealers are well trained and ready to give you the support you need to get the most from your AAEON products. In fact, most problems reported are minor and are able to be easily solved over the phone.

In addition, free technical support is available from AAEON engineers every business day. We are always ready to give advice on application requirements or specific information on the installation and operation of any of our products.

Product Warranty

AAEON warrants to you, the original purchaser, that each of its products will be free from defects in materials and workmanship for two years from the date of purchase.

This warranty does not apply to any products which have been repaired or altered by persons other than repair personnel authorized by AAEON, or which have been subject to misuse, abuse, accident or improper installation. AAEON assumes no liability under the terms of this warranty as a consequence of such events.

Because of AAEON's high quality-control standards and rigorous testing, most of our customers never need to use our repair service. If an AAEON product is defective, it will be repaired or replaced at no charge during the warranty period. For out-of-warranty repairs, you will be billed according to the cost of replacement materials, service time, and freight. Please consult your dealer for more details.

If you think you have a defective product, follow these steps:

1. Collect all the information about the problem encountered. (For example, CPU type and speed, AAEON products used, other hardware and software used, etc.) Note anything abnormal and list any on-screen messages you get when the problem occurs.
2. Call your dealer and describe the problem. Please have your manual, product, and any helpful information readily available.
3. If your product is diagnosed as defective, obtain an RMA (return material authorization) number from your dealer. This allows us to process your return more quickly.
4. Carefully pack the defective product, a fully-completed Repair and Replacement Order Card and a photocopy proof of purchase date (such as your sales receipt) in a shippable container. A product returned without proof of the purchase date is not eligible for warranty service.
5. Write the RMA number visibly on the outside of the package and ship it prepaid to your dealer.

Packing List

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

1.PCM-5896 All-in-One Single Board Computer

2.Quick Installation Guide

3.CD-ROM contains the followings:

- User Manual (this manual in PDF file)
- Ethernet drivers and utilities
- VGA drivers and utilities
- Audio drivers and utilities
- Lastest BIOS (as of the CD-ROM was made)

The PCM-5896 requires several cables for operation. You can make them yourself or pruchase an optioanl cable kit, PCM-10489-5 .

If any of these items are missing or damaged, contact your distri-buitor or sales represntative immediately.

Notice

Dear Customer,

Thank you for purchasing the PCM-5896 board. This users manual is designed to help you to get the most out of the PCM-5896, please read it thoroughly before you install and use the board. The product that you have purchased comes with an two-year limited warranty, but AAEON will not be responsible for misuse of the product. Therefore, we strongly urge you to first read the manual before using the product.

To receive the lastest version of the user manual, please visit our Web site at:

http://www.aaeon.com.tw

Contents

CHAPTER 1

General Information

This chapter gives background information on the mainboard.

Sections include:

- Board Introduction
- Board Features
- Board Specifications

Introduction

The PCM-5896 is an all-in-one multi-media Pentium processor based single board computer (SBC) with a 32-bit PCI audio controller, a PCI Flat Panel controller, a PCI 10/100Base-T Ethernet interface, and one PCI expansion slot. With 100MHz system bus, the PCM-5896 achieves outstanding performance that surpasses any other SBC in its class. In addition, the onboard SSD interface supports M-systems DiskOnChip 2000 series, memory capacity from 2 MB to 1GB. This compact (only 5.75" x 8") unit offers all the functions of a single board industrial computer, but still fits in the space of a CD-ROM drive.

On-board features include four serial ports (three RS-232, one RS-232/422/485), one multi-mode parallel (ECP/EPP/SPP) port, connector for two USB (Universal Serial Bus) ports, a floppy drive controller, and a keyboard/PS/2 mouse interface. The built-in high speed PCI IDE controller supports Ultra DMA/33 mode. Up to two IDE devices can be connected, including large hard disks, CD-ROM drives, and tape backup drives, etc.

The PCM-5896 also features power management to minimize power consumption. It complies with the ACPI standard and supports three types of power saving features: Doze mode, Standby mode, and Suspend mode. In addition, the board's watchdog timer can automatically reset the system or generate an interrupt in case the system stops due to a program bug or EMI.

Highly integrated multi-media SBC

The PCM-5896 is a highly integrated multi-media SBC that combines audio, video, and network functions on a CD-ROM drive size single computer board. It provides 32-bit half-duplex, 16-bit full-duplex, PCI 3D audio and up to 1024 x 768 resolution @ 64K colors with on-chip 2MB SDRAM display memory. Major onboard devices adopt PCI technology to achieve outstanding computing performance.

Features

- On board Intel Mobile Pentium MMX 266MHz BGA Processor.
- DiskOnChip (SSD) up to 1GB
- 64-bit PCI-bus SVGA/LCD controller supports LCD & CRT display
- 10/100Base-T Ethernet interface, supports Remote Boot ROM function.
- 32-bit audio interface, Sound Blaster Pro compatible
- Supports Bus Master and Ultra DMA/33 IDE devices
- Three RS-232 and one RS-232/422/485 serial ports
- USB interface, PCI slot, and PC/104 connector for flexible expansion capabilities

Specifications

Standard SBC Functions

CPU: Intel Mobile Pentium MMX 266MHz BGA Processor

BIOS: Award 256KB Flash BIOS

Chipset: ALi 1541/1543

I/O Chipset: ALi 1543/ITE IT8661F. Full 16-bit I/O decoded

Memory: Onboard one 168-pin DIMM socket supports up to 256Mbytes SDRAM

Enhanced IDE: Support up to two IDE devices. Supports Ultra DMA/33 mode with data transfer rate up to 33MB/sec

FDD interface: Supports up to two floppy disk drives, 5.25" (360KB and 1.2MB) and /or 3.5" (720KB, 1.44MB, and 2.88MB)

Parallel port: One bi-directional parallel port. Supports SPP, ECP, and EPP modes

Serial ports: Three RS-232 and one RS-232/422/485 serial ports. Ports can be configured as COM1, COM2, COM3, COM4, or disabled individually. (16C550 equivalent)

IR interface: Supports one IrDA Tx/Rx header

Keyboard/mouse connector: 8 pin connector supports PC/AT keyboard and PS/2 mouse

USB connectors: 4 x 2 header onboard supports dual USB ports

Battery: Lithium battery for data retention

Watchdog Timer: Can generate a system reset, IRQ15, or NMI. Support software selectable timeout interval. (2 sec. ~ 255 sec., 1 sec./ step)

DMA: 7 DMA channels (8237 equivalent)

Interrupt: 15 interrupt levels (8259 equivalent)

Power management: Supports ATX power supply. Supports PC97, LAN wake up, and modem ring-in functions. I/O peripheral devices support power saving and doze/standby/suspend modes. APM 1.2 compliant

H/W status monitoring: Winbond W83781D H/W status monitoring IC supports power supply voltage and temperatures monitoring

Flat Panel/CRT Interface

Chipset: C&T 69000

Display memory: Built-in 2MB SDRAM

Display type: Supports non-interlaced CRT and LCD (TFT, DSTN, and Mono) displays. Can display both CRT and Flat Panel simultaneously

Resolution: Up to 1024x768@64K colors

PCI Sound Interface

Chipset: ESS ES1938 (Solo-1)

Audio interface: 16-bit stereo VLSI chip, PCI based AC 97 Digital Audio Processor, Sound Blaster / Pro emulation.

Ethernet Interface

Chipset: Reltek RTL8139DL 10/100Base-T Fast Ethernet controller

Ethernet interface: 10/100Base-Tx RJ-45 connector. Optional Remote Boot ROM function

SSD Interface

One 32-pin DIP socket supports M-systems DiskOnChip 2000 Series up to 1GB

Expansion Slots

PC/104 connector: One 16-bit 104-pin connector onboard

PCI slot: One 32-bit PCI slot onboard

Mechanical and Environmental

Power supply voltage: +5V (4.75V to 5.25V),
+12V (11.4V to 12.6V)

Typical power requirement: +5V@8A

Operating temperature: 32 to 140°F (0 to 60°C)

Board size: 8"(L) x 5.75"(W) (203mm x 146mm)

Weight: 1.2 lb. (0.5 Kg)

CHAPTER 2

Installation

This chapter describes how to set up the main board 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, Switch 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.

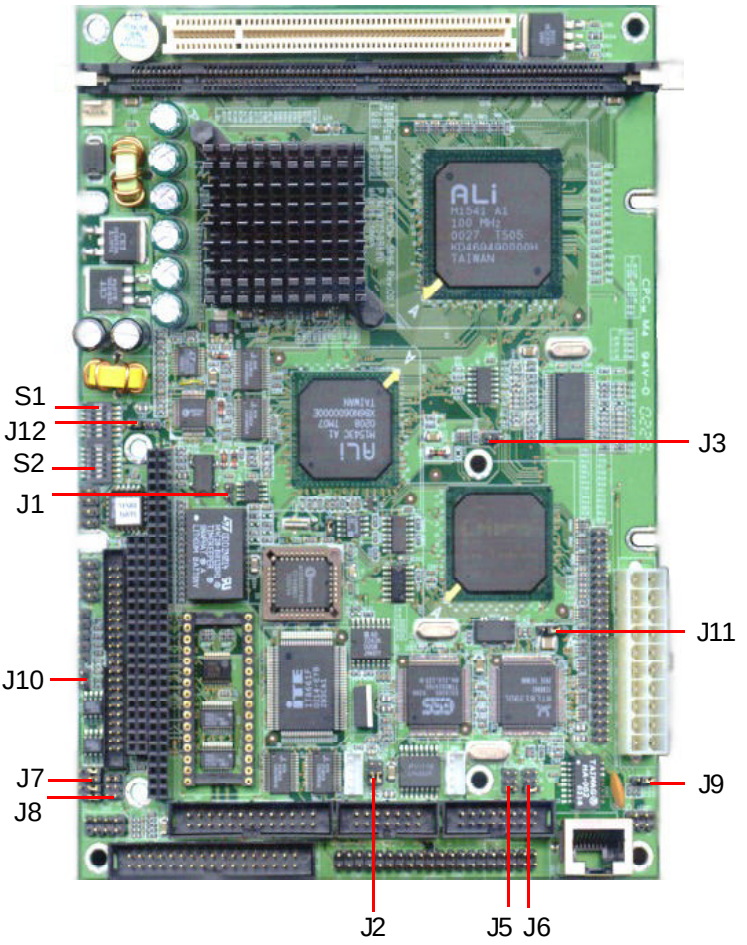
The following tables list the function of each of the board's jumpers and connectors.

Jumpers	
Lable	**Function**
J1	Clear CMOS select
J2	Audio output select
J5	COM3 RI pin voltage select
J6	COM4 RI pin voltage select
J7, J8	COM2 RS232/422/485 select
J9	LCD Panel Voltage Select
J10	ATX Soft-Power Switch Connector
J11	LCD Clock Signal Select
J12	DOC memory address select

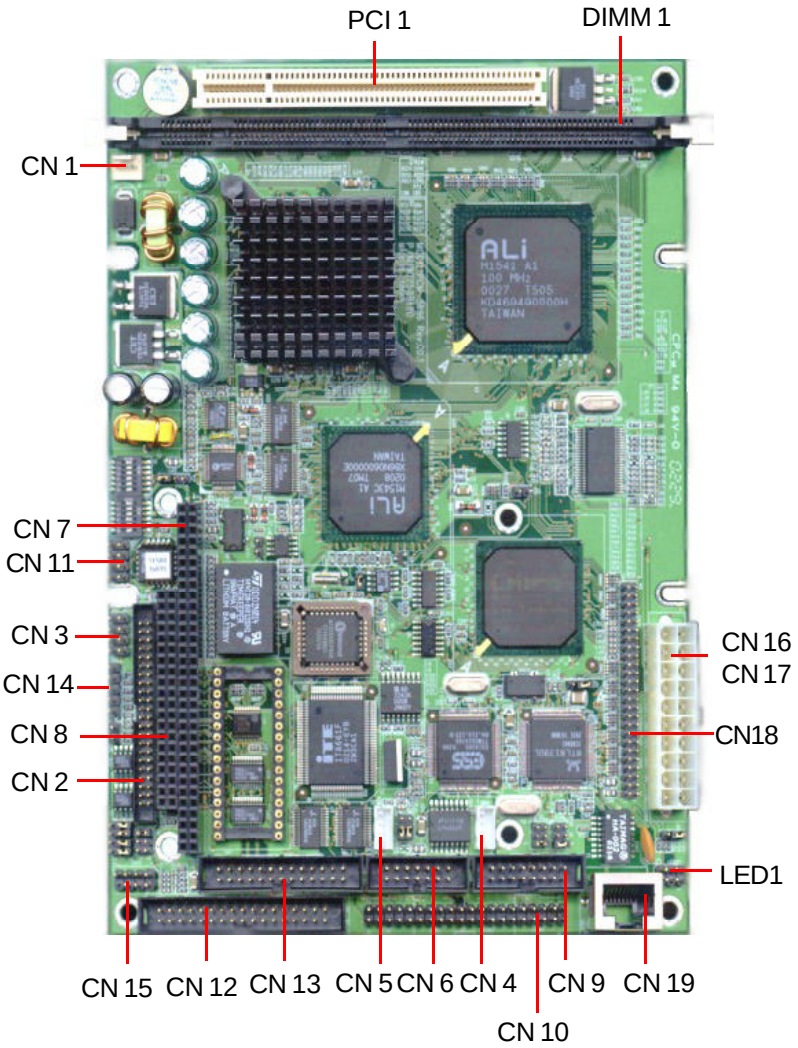
Switch	
Lable	**Function**
S1	CPU Vcore select
S2	CPU Clock & frequency ratio select

Connectors	
Label	**Function**
CN1	CPU Fan Connector
CN2	IDE Connector
CN3	Front Panel Connector
CN4	Reserved
CN5	CD Audio Connector
CN6	Audio Connector
CN7, CN8	PC104 Connector
CN9	VGA Connector
CN10	Serial Ports Connector
CN11	USB Connector
CN12	Floppy Connector
CN13	Parallel Port Connector
CN14	IR Connector
CN15	KB & Mouse Connector
CN16	AT power Connector
CN17	ATX power Connector
CN18	LCD Connector
CN19	LAN connector
LED1	LAN LED Connector
DIMM1	DIMM Connector
PCI1	PCI Slot Connector

Locating jumpers

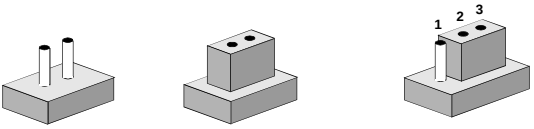


Locating connectors



Setting jumpers

You can 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 representative before you make any changes.

CPU installing and upgrading

PCM-5896 Rev.C with onboard Intel Mobile Pentium 266MHz BGA processor allows no CPU speed adjustment.

Warning! *Always disconnect the power cord from your chassis when you are working on it. Do not make connections while the power is on as 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 PC board. 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.*

DO NOT Change any default CPU setting. any settings change may damage the CPU.

Installing DRAM (DIMMs)

System Memory

The left edge of the PCM-5896 Rev. C contains a socket for 168-pin dual inline memory module (DIMM). The socket uses 3.3 V unbuffered synchronous DRAM (SDRAM). DIMM is available in capacities of 16, 32, 64, 128 or 256 MB. The socket can be filled in the DIMM of any size, giving your PCM-5896 Rev. C single board computer between 16 and 256 MB of memory.

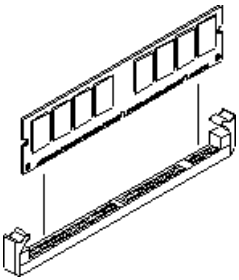
Supplementary information about DIMM

Your PCM-5896 can accept both regular and PC-100 SDRAM DIMM Module(with or without parity). However, if the CPU with higher than 66MHz Front Side Bus is used, the PCM-5896 can only accept PC-100 SDRAM DIMM Module.

Single-sided modules are typically 16 or 64 MB; double-sided modules are usually 32 or 128 MB.

Memory Installation Procedures

To install DIMM, first make sure the two handles of the DIMM socket are in the "open" position. i.e. The handles remain outward. Slowly slide the DIMM module along the plastic guides on both ends of the socket. Then press the DIMM module right down into the socket, until you hear a click. This is when the two handles have automatically locked the memory module into the correct position of the DIMM socket. (See Figure below) To take away the memory module, just push both handles outward, and the memory module will be ejected by the mechanism in the socket.



Clear CMOS (J1)

You can use J1 to clear the CMOS data if necessary. To reset the CMOS data, place a jumper on J1 for just a few seconds, and then remove the jumper.

Clear CMOS (J1)

	Protect*	Clear CMOS
J1	1 ○ 2 ○	1  2

*default

The function is disable when power off.

When power off, short J1 and then turn on the power, the CMOS will be cleared.

Audio output select (J2)

You can select the onboard audio output by setting J2.

"Speaker out" is the output signal amplified by onboard amplifier

Audio output select (J2)

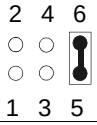
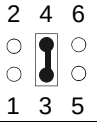
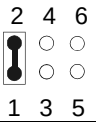
	Line out	Speaker out *
J2	1  2 3 4 5 ○ ○ 6	1 ○ ○ 2  3 4 5 6

*default

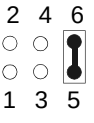
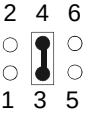
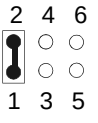
COM3/COM4 RI pin voltage select (J5, J6)

The 9th pin of COM3 and COM4 (9-pin D-Sub connector) can be selected as RI, +5V, or +12V by setting J5 & J6.

COM3 RI pin setting (J5)

	RI*	+5V	+12V
J5			

COM4 RI pin setting (J6)

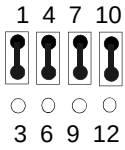
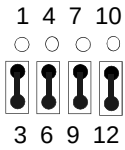
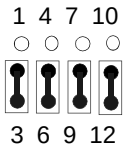
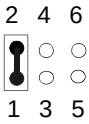
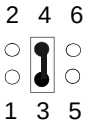
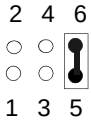
	RI *	+5V	+12V
J6			

*default

COM2 RS-232/422/485 select (J7, J8)

The PCM-5896 Rev. C COM2 serial port can be selected as RS-232, RS-422, or RS-485 by setting J7 & J8.

COM2 Select (J7, J8)

	RS-232*	**RS-422**	**RS-485**
J7			
J8			

*default

LCD driving voltage select (J9)

You can select the LCD driving voltage by setting J9. The configurations are as follows:

LCD driving voltage select (J9)

	5V	3.3V *
J9		

*default

ATX Soft-Power Switch connector (J10)

The ATX Soft-Power switch connector is a 2-pin header. Use a switch cable to connect the pin header and the system.

LCD clock signal select (J11)

You can select the LCD control signal by setting J11. The following charts show the available option.

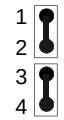
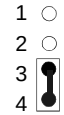
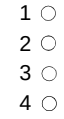
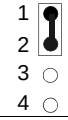
LCD clock signal select (J11)

	ASHF CLK	SHF CLK *
J11		

*default

DOC memory address select (J12)

The DiskOnChip 2000 occupies an 8 Kbyte window in the upper memory address range of D400 to E000. You should ensure this does not conflict with any other device's memory address. J12 controls the memory address of the Flash disk.

DiskOnChip 2000 memory address (J12)	
Memory address (HEX)	
DISABLE	
DC00	
D400	
D800*	

* default

These addresses might conflict with the ROM BIOS of other peripheral boards. Please select the appropriate memory address to avoid memory conflicts.

S1 (1~5) CPU Vcore select

PCM-5896 Rev.C onboard Intel Mobile Pentium MMX 266MHz BGA CPU, it is not necessary to change any default CPU setting.

CAUTION: DO NOT CHANGE THE DEFAULT SETTING, OTHERWISE THE CPU MAY BE DAMAGED

	S1-5	S1-4	S1-3	S1-2	S1-1	Vcore
	1	1	0	1	0	1.8V
	1	1	0	1	1	1.85V
	1	1	1	0	0	1.9V
	1	1	1	0	1	1.95V
*	1	1	1	1	0	2.0V
	1	1	1	1	1	2.05V
	0	0	0	0	1	2.1V
	0	0	0	1	0	2.2V
	0	0	0	1	1	2.3V
	0	0	1	0	0	2.4V
	0	0	1	0	1	2.5V
	0	0	1	1	0	2.6V
	0	0	1	1	1	2.7V
	0	1	0	0	0	2.8V
	0	1	0	0	1	2.9V
	0	1	0	1	0	3.0V
	0	1	0	1	1	3.1V
	0	1	1	0	0	3.2V
	0	1	1	0	1	3.3V
	0	1	1	1	0	3.4V
	0	1	1	1	1	3.5V

1 : ON 0 : OFF * default

S2 (1~3) CPU clock select

CAUTION: DO NOT CHANGE THE DEFAULT SETTING, OTHERWISE THE CPU MAY BE DAMAGED.

	S2-1	S2-2	S2-3	CPU	PCI Bus
	1	1	1	60 MHz	30 MHz
*	0	1	1	66.8 MHz	33.4 MHz
	1	1	0	75 MHz	30 MHz
	0	1	0	83.3 MHz	33.3 MHz
	1	0	0	90 MHz	30 MHz
	0	0	0	100 MHz	33.3 MHz

1 : ON 0 : OFF * default

S2 (4~6) CPU Frequency ratio select

CAUTION: DO NOT CHANGE THE DEFAULT SETTING, OTHERWISE THE CPU MAY BE DAMAGED.

	S2-4	S2-5	S2-6	Mobile Pentium MMX
	1	1	1	166MHz
*	0	1	1	266MHz

1 : ON 0 : OFF * default

CPU Fan Connector (CN1)

CN1 is a 3-pin fan connector onboard. Please connect your fan cable to this connector to power the fan.

CPU fan power connector (CN1)

Pin	Signal
1	GND
2	+12V
3	Fan speed sense

IDE Connector (CN2)

IDE Connector(CN2)

Pin	Signal	Pin	Signal
1	HDRSTJ	2	Ground
3	PID7	4	PID8
5	PID6	6	PID9
7	PID5	8	PID10
9	PID4	10	PID11
11	PID3	12	PID12
13	PID2	14	PID13
15	PID1	16	PID14
17	PID0	18	PID15
19	Ground	20	N/C
21	PDRQ	22	Ground
23	PIOW	24	Ground
25	PIOR	26	Ground
27	PRDY	28	Ground (ALE)
29	PACK	30	Ground
31	PIRQ	32	N/C
33	PPDA1	34	N/C
35	PPDA0	36	PPDA2
37	PPCS1	38	PPCS3
39	HLED	40	Ground

Front Panel Connector (CN3)

Next you may want to install external LEDs and switches to monitor and control the mainboard. These features are completely optional. Install them only if you need them. The front panel connector (CN3) 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.

Front Panel Connector(CN3)

Pin	Signal	Pin	Signal
1	HLED	5	VCC
2	SPK	6	Ground
3	X	7	Ground
4	RSTIN	8	Ground

CD Audio Connector (CN5)

This connector is used to connect to a CD audio cable.

CD Audio Connector (CN5)

Pin	Signal
1	GND
2	CD_L
3	GND
4	CD_R

Audio Connector (CN6)

The PCM-5896 Rev.C provides all major audio signals on a 14-pin flat cable connector CN6.

Attach the Mic In, Line In, and Audio Out to the corresponding pins as shown in the following table.

Audio Connector (CN6)

Pin	Signal	Pin	Signal
1	Mic In	2	Reserve for future use
3	GND	4	Reserve for future use
5	Line In Left	6	Reserve for future use
7	Line In Right	8	Reserve for future use
9	GND	10	Reserve for future use
11	Audio Out Left	12	Audio Out Right
13	GND_Line out	14	GND_Speaker out

CAUTION: Both Line-out and Speaker-out modes share the same pair of Audio Out signal lines but different grounds. In addition to setting up J2 on page 17, make sure you use the corresponding ground signal when making the cable by yourself.

VGA Connector (CN9)

CN9 is a 16-pin, dual-in-line header used for conventional CRT displays. A simple one-to-one adapter can be used to match CN9 to a standard 15-pin D-SUB connector commonly used for VGA.

VGA Connector (CN9)

Pin	Signal	Pin	Signal
1	RED	9	VCC +5
2	GREEN	10	GND
3	BLUE	11	N/C
4	N/C	12	DDC DAT
5	GND	13	H-SYNC
6	GND	14	V-SYNC
7	GND	15	DDC CLK
8	GND	16	N/C

Serial Ports Connector (CN10)

The PCM-5896 Rev. C offers four serial ports, three RS-232 and one RS-232/422/485. These ports allow you to connect them to serial devices (mouse, printers, etc.).

Serial Ports Connector(CN10)

Pin	Signal	Pin	Signal
1	NRLSD1	2	NRXD1
3	NTXD1	4	NDTR1
5	Ground	6	NDSR1
7	NRTS1	8	NCTS1
9	NRI1	10	N/C
11	CM2_1	12	CM2_2
13	CM2_3	14	CM2_4
15	Ground	16	NDSR2
17	NRTS2	18	NCTS2
19	NRI2	20	N/C
21	DCDA	22	RXDA
23	TXDA	24	DTRA
25	Ground	26	DSRA
27	RTSA	28	CTSA
29	NNRI0	30	N/C
31	DCDB	32	RXDB
33	TXDB	34	DTRB
35	Ground	36	DSRB
37	RTSB	38	CTSB
39	NNRI1	40	N/C

USB Connector (CN11)

The PCM-5896 Rev.C provides two USB (Universal Serial Bus) interfaces, which give complete plug and play, hot attach/detach for up to 127 external devices. The USB interfaces comply with USB specification Rev. 1.0, and can be disabled in the system BIOS setup.

USB Connector (CN11)

Pin	Function	Pin	Function
1	GND	5	Vcc
2	UD1+	6	UD0-
3	UD1-	7	UD0+
4	Vcc	8	GND

Floppy Connector (CN12)

Floppy Connector (CN12)			
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 DELECT
33	GND	34	DISK CHANGE

Parallel Port Connector (CN13)

Normally, the parallel port is used to connect the board to a printer. The mainboard includes an onboard parallel port, accessed through PC1, a 26-pin flat-cable connector. You 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 Connector (CN13)

Pin	Signal	Pin	Signal
1	STB-	14	AFD-
2	PTD0	15	ERR-
3	PTD1	16	INI-
4	PTD2	17	SLIN-
5	PTD3	18	Ground
6	PTD4	19	Ground
7	PTD5	20	Ground
8	PTD6	21	Ground
9	PTD7	22	Ground
10	ACK-	23	Ground
11	BUSYY	24	Ground
12	PEE	25	Ground
13	SLCTT	26	N/C

IR Connector (CN14)

The IrDA connector (CN14) can be configured to support wireless infrared module, with this module and application software such as laplink or Win95 Direct Cable connection, user can transfer files to or from laptops, notebooks, PDA and printers. This connector supports HPSIR (115.2Kbps, 2 meters).

Install infrared module onto IrDA connector and enable infrared function from BIOS setup. Make sure to have correct orientation when you plug onto IrDA connector (CN14).

Ir Connector (CN14)

Pin	Signal
1	+5V
2	FIRRX
3	IRRXX
4	GND
5	IRTXX

KB & Mouse Connector (CN15)

The mainboard 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 mainboard BIOS Advanced setup menu allows you to select "Present" or "Absent" under the "System Keyboard" section. This allows no-keyboard operation in embedded system applications without the system halting under POST (power-on-self-test).

KB & Mouse Connector (CN15)

Pin	Signal	Pin	Signal
1	KBDT	5	MSDT
2	KBCK	6	MSCK
3	Ground	7	N/C
4	KBVCC		

AT/ATX Power Connectors (CN16, CN17)

AT Power Connector (CN16)

The AT power supply uses a 12-pin connector shown below. Make sure you plug in the right direction.

AT Power Connector (CN16)

Pin	Signal
1	N/C
2	5 Volt.
3	12 Volt.
4	-12 Volt.
5	Ground
6	Ground
7	Ground
8	Ground
9	-5 Volt.
10	5 Volt.
11	5 Volt.
12	5 Volt.

ATX Power Connector (CN17)

The AT power supply uses a 20-pin connector shown below. Make sure you plug in the right direction.

ATX Power Connector (CN17)

Pin	Signal	Pin	Signal
1	3.3 Volt.	11	3.3 Volt.
2	3.3 Volt.	12	-12 Volt.
3	Ground	13	Ground
4	5 Volt.	14	POWERGOOD
5	Ground	15	Ground
6	5 Volt.	16	Ground
7	Ground	17	Ground
8	POK	18	-5 Volt.
9	5 Volt. Stand By	19	5 Volt.
10	12 Volt.	20	5 Volt.

LCD Connector (CN18)

CN18 is a 50-pin, dual-in-line header used for flat panel displays.

When the mainboard'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 do not have to set any jumpers.

LCD Connector (CN18)

Pin	Signal	Pin	Signal
1	+12 V_{DC}	2	+12 V_{DC}
3	GND	4	GND
5	+5 V_{DC}	6	+5 V_{DC}
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	P24	34	P25
35	SHF CLK	36	FLM (V SYS)
37	M	38	LP (H SYS)
39	GND	40	ENABKL
41	P26	42	P27
43	P28	44	P29
45	P30	46	P31
47	P32	48	P33
49	P34	50	P35

LAN Connector(CN19)

This Ethernet connector is a standard RJ-45 connector.

The onboard Realtek 8139DL (or Intel 82559) fast Ethernet controller supports 10Mb/s and 100 Mb/s N-way auto-negotiation operation.

LAN Connector (CN19)

Pin	Signal	Pin	Signal
1	Tx+	2	Tx-
3	Rx+	4	N/C
5	N/C	6	Rx-
7	N/C	8	N/C

LAN LED Connector (LED1)

These LEDs can show the status of Ethernet

LAN LED Connector(LED1)

Pin	Signal	Pin	Signal
1	LED2	2	+5V
3	LED1	4	+5V
5	LED0	6	+5V

For RTL8139DL:

Pin 1, 2: RX

Pin 3, 4: Link 10/100

Pin 5, 6: TX

For INTEL82559

Pin 1, 2: Speed light=100M, dark=10M

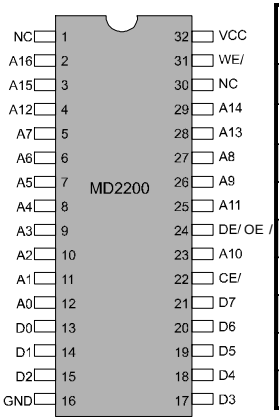
Pin 3, 4: Link

Pin 5, 6: Active

DiskOnChip socket (U41)

The DiskOnChip 2000 family of products provides a single chip solid-state flash disk in a standard 32-pin DIP package. The DiskOnChip 2000 is a solid-state disk with no moving parts, resulting in a significant reduction in power consumption and an increase in reliability. The DiskOnChip is a small plug and play Flash disk. It is easy to use. And it saves integration overhead.

The DiskOnChip 2000 family of products is available in capacities ranging from 2MB up to 1GB, unformatted. In order to manage the disk, the DiskOnChip 2000 includes the TrueFFS, M-Systems Flash File System proprietary software. The DiskOnChip 2000 package is pin-to-pin compatible with a standard 32-pin EPROM device.



pin Name	Description	Pin Number	Direction	Note
A0-A12	Address bus	4-12,23,25-27	Inputs	
A13-A16	Address bus	2,3,28,29	Inputs	1
D0-D7	Data bus	13-15,17-21	I/O	
CE/	Chip Enable	22	Input	
OE/	Output Enable	24	Input	
WE/	Write Enable	31	Input	
NC	Not connected	1.30		2
VCC	Power	32		
GND	Ground	16		

Note 1: Pins A13 through A16 are not used by the MD2200. They are kept for socket backward compatibility with ED 1100 (DiskOnChip 1000)

Note 2: Pins 1 and 30 are not used by MD2200

DiskOnChip (DOC) 2000 Installation

When the DOC is installed correctly, a DOC will work like an HDD or an FDD. To install the DOC on the mainboard, follow the instructions below:

1. Plug the DOC into the socket. Make sure pin 1 of the DOC is aligned with pin 1 of the socket.
2. Push the DOC into the socket until it is firmly seated in the socket.

Caution: the DOC may be permanently damage if it is installed incorrectly.

3. Set the jumper for the memory address of the DOC.

Note:

The memory shadow function sometimes will create conflicts with the memory window. You should disable the memory shadow from the BIOS SETUP if the DOC cannot be accessed.

Configure DOC as a boot device

To configure a DOC as a boot drive, you should copy the operating system files onto the DOC. The following procedure is an example of the initialization process.

1. Install a DOC into your system.
2. Insert a bootable floppy disk in drive A: and boot the system.
3. At the DOS prompt, type **SYS C:** to transfer the DOS system files to the DOC (assuming the DiskOnChip is installed as drive C:). Reboot the system.
4. Go to the BIOS Setup Utility by hitting the <DEL> key. Set the type of Primary Master or C: Drive as *Not Installed*.
5. Remove the floppy disk from the drive A: and leave the BIOS Setup Utility. The system should boot from the DOC.

CHAPTER 3

Award BIOS Setup

This chapter describes how to configure the BIOS for the PCM-5896.

Starting setup

The Award BIOS is immediately activated when you first turn on the computer. The BIOS reads system configuration information in CMOS RAM and begins the process of checking out the system and configuring it through the power-on self test (POST).

When these preliminaries are finished, the BIOS seeks an operating system on one of the data storage devices (hard drive, floppy drive, etc.). The BIOS launches the operating system and hands control of system operations to it.

During POST, you can start the Setup program in one of two ways:
1.By pressing Del immediately after switching the system on, or
2.By pressing Del or pressing Ctrl-Alt-Esc when the following message appears briefly at the bottom of the screen during POST:

TO ENTER SETUP BEFORE BOOT PRESS DEL KEY

If the message disappears before you respond and you still wish to enter Setup, restart the system to try again by turning it OFF then ON or pressing the RESET button on the system case. You may also restart by simultaneously pressing Ctr-Alt-Del. If you do not press the keys at the correct time and the system does not boot, an error message appears and you are again asked to

PRESS F1 TO CONTINUE, DEL TO ENTER SETUP

Setup keys

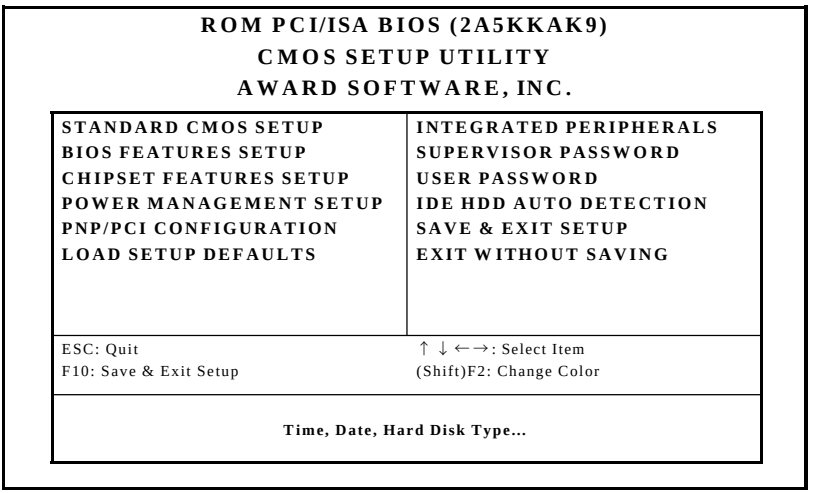
These keys helps you navigate in Setup:

Up arrow	Move to previous item
Down arrow	Move to next item
Left arrow	Move to the item in the left hand
Right arrow	Move to the item in the right hand
Esc	Main Menu: Quit and not save changes into CMOS RAM Other pages: Exit current page and return to Main Menu
PgDn/+	Increase the numeric value or make changes
PgDn/-	Decrease the numeric value or make changes
F1	General help, only for Status Page Setup Menu and Option Page Setup Menu
F2	Change color from total 16 colors. F2 to select color forward, Shift-F2 to select color backward
F3	Calendar, only for Status Page Setup Menu
F4	Reserved
F5	Restore the previous CMOS value from CMOS, only for Option Page Setup Menu
F6	Load the default CMOS RAM value from BIOS default table, only for Option Page Setup Menu
F7	Load the default
F8	Reserved
F9	Reserved
F10	Save all the CMOS changes, only for Main Menu

Getting help

Press F1 to pop up a small help window that describes the appropriate keys to use and the possible selections for the highlighted item. To exit the Help Window press Esc or the F1 key again.

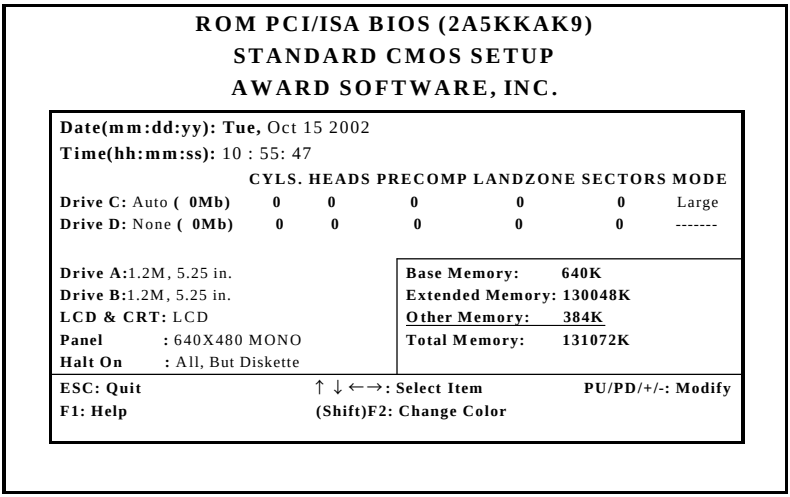
Main setup Menu



Standard CMOS	Options in the original PC AT-compatible BIOS.
BIOS Features	Award Software enhanced BIOS options.
Chipset Features	Options specific to your system chipset.
Power Management	Advanced Power Management (APM) options.
PnP/PCI Configuration	Plug and Play standard and PCI Local Bus configuration options.
Load Setup Defaults	Setup defaults are factory settings for optimal-performance system operations.
Integrated Peripherals	I/O subsystems that depend on the integrated peripherals controller in your system.
Supervisor/User Password Setting	Change, set, or disable a password. In BIOS versions that allow separate user and supervisor passwords, only the supervisor password permits access to Setup. The user password generally allows only power-on access.

IDE HDD Auto Detection	Automatically detect and configure IDE hard disk parameters.
Save & Exit Setup	Save settings in nonvolatile CMOS RAM and exit Setup.
Exit Without Save	Abandon all changes and exit Setup.

Standard CMOS setup



This standard setup menu allows users to configure system components such as the date, time, hard disk drive, floppy drive, display, and memory. Online help for each field can be accessed by pressing F1.

Date and Time Configuration

The BIOS determines the day of the week from the other date information. This field is for information only.

Press the left or right arrow key to move to the desired field (date, month, year). Press the PgUp/- or PgDn/+ key to increment the setting, or type the desired value into the field.

The time format is based on the 24-hour military-time clock. For example, 1 p.m. is 13:00:00. Press the left or right arrow key to move to the desired field. Press the PgUp/- or PgDn/+ key to increment the setting, or type the desired value into the field.

HARD DISKS

The BIOS supports up to two IDE drives. This section does not show information about other IDE devices, such as a CD-ROM drive, or about other hard drive types, such as SCSI drives.

***NOTE**: We recommend that you select type AUTO for all drives.*

The BIOS can automatically detect the specifications and optimal operating mode of almost all IDE hard drives. When you select type AUTO for a hard drive, the BIOS detects its specifications during POST, every time the system boots.

If you do not want to select drive type AUTO, other methods of selecting the drive type are available:

1. Match the specifications of your installed IDE hard drive(s) with the preprogrammed values for drive types 1 through 45.

2. Select USER and enter values into each drive parameter field.

3. Use the IDE HDD AUTO DECTECTION function in Setup.

Here is a brief explanation of drive specifications:

Type: The BIOS contains a table of pre-defined drive types. Each defined drive type has a specified number of cylinders, number of heads, write precompensation factor, landing zone, and number of sectors. Drives whose specifications do not accommodate any pre-defined type are classified as type USER.

Size: Disk drive capacity (approximate). Note that this size is usually slightly greater than the size of a formatted disk given by a disk-checking program.

Cyls: Number of cylinders

Head: Number of heads

Precomp: Write precompensation cylinder

Landzone: Landing zone

Sector: Number of sectors

Mode: Auto, CHS, Large, or LBA

- **Auto**: The BIOS automatically determines the optimal mode.
- **CHS**: This allows the user to enter their own hardware values.
- **Large**: For drives that do not support LBA and have more than 1024 cylinders.
- **LBA** (Logical Block Addressing): During drive accesses, the IDE controller transforms the data address described by sector, head, and cylinder number into a physical block address, significantly improving data transfer rates. For drives with greater than 1024 cylinders.

Drive A
Drive B

Select the correct specifications for the diskette drive(s) installed in the computer.

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

LCD & CRT:
This field may appear as an alternative to the Video field. select your video display device:

LCD	Liquid crystal display
CRT	Auxiliary monitor
Both	Display on both devices

Pannel:
This selection item allows user to select LCD BIOS to match the LCD types. There are eight, LCD types available for users to select as their LCD display modes as below:

Brand name	Model name	Format
Sharp	LX 15X80	1024 x 768 DSTN
Sharp	LM 64183P	640 x 480 MONO
Sharp	LM 64C35P	640 x 480 DSTN
Sharp	LM 12S40	800 x 600 DSTN
NEC	NL 6448AC33-10	640 x 480 TFT (12 bits)
Toshiba	LTM 10C209A	640 x 480 (18 bits)TFT
NEC	NL 8060AC26-04	800 x 600 TFT
Sharp	LQ 14x03	1024x768 TFT (36 bits)

Halt On

During the power-on-self-test (POST), the computer stops if the BIOS detects a hardware error. You can tell the BIOS to ignore certain errors during POST and continue the boot-up process. These are the selections:

No errors: POST does not stop for any errors.

All errors: If the BIOS detects any non-fatal error, POST stops and prompts you to take corrective action.

All, But Keyboard: POST does not stop for a keyboard error, but stops for all other errors

All, But Diskette: POST does not stop for diskette drive errors, but stops for all other errors.

All, But Disk/Key: POST does not stop for a keyboard or disk error, but stops for all other errors.

Memory

You cannot change any values in the Memory fields; they are only for your information. The fields show the total installed random access memory (RAM) and amounts allocated to base memory, extended memory, and other (high) memory. RAM is counted in kilobytes (KB: approximately one thousand bytes) and megabytes (MB: approximately one million bytes).

RAM is the computer's working memory, where the computer stores programs and data currently being used, so they are accessible to the CPU. Modern personal computers may contain up to 64 MB, 128 MB, or more.

• Base Memory

Typically 640 KB. Also called conventional memory. The DOS operating system and conventional applications use this area.

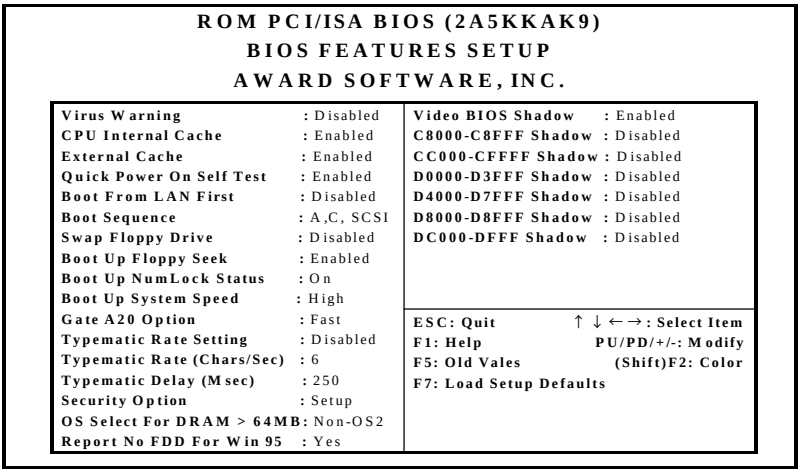
• Extended Memory

Above the 1-MB boundary. Early IBM personal computers could not use memory above 1 MB, but current PCs and their software can use extended memory.

• Other Memory

Between 640 KB and 1 MB; often called High memory. DOS may load terminate-and-stay-resident (TSR) programs, such as device drivers, in this area, to free as much conventional memory as possible for applications. Lines in your CONFIG.SYS file that start with LOADHIGH load programs into high memory.

BIOS features setup



The displayed configuration is based on the manufacturer's SETUP DEFAULTS settings.

Virus Warning

When enabled, you receive a warning message if a program (specifically, a virus) attempts to write to the boot sector or the partition table of the hard disk drive. You should then run an anti-virus program. Keep in mind that this feature protects only the boot sector, not the entire hard drive.

NOTE: *Many disk diagnostic programs that access the boot sector table can trigger the virus warning message. If you plan to run such a program, we recommend that you first disable the virus warning.*

CPU Internal Cache/External Cache

Cache memory is additional memory that is much faster than conventional DRAM (system memory). CPUs from 486-type on up contain internal cache memory, and most, but not all, modern PCs have additional (external) cache memory. When the CPU requests data, the system transfers the requested data from the main DRAM into cache memory, for even faster access by the CPU.

The External Cache field may not appear if your system does not have external cache memory.

Quick Power On Self Test

Select Enabled to reduce the amount of time required to run the power-on-self-test (POST). A quick POST skips certain steps. We recommend that you normally disable quick POST. Better to find a problem during POST than lose data during your work.

Boot From LAN First

To enable this function for booting from LAN (Optinal function).

Boot Sequence

The original IBM PCs loaded the DOS operating system from drive A (floppy disk), so IBM PC-compatible systems are designed to search for an operating system first on drive A, and then on drive C (hard disk). However, the BIOS now offers many boot sequence options.

"A,C, SCSI" "C, A, SCSI" "C, CDROM, A" "CDROM, C, A" "D,A, SCSI" "SCSI, A,C" "SCSI, C,A" "C only" "LS120, C" "ZIP100, C" "USB-FDD,C" "USB-ZIP,C" "USB-CD, C" "USB-HDD, C"

Swap Floppy Drive

This field is effective only in systems with two floppy drives. Selecting enabled assigns physical drive B to logical drive A, and physical drive A to logical drive B.

Boot Up Floppy Seek

When Enabled, the BIOS tests (seeks) floppy drives to determine whether they have 40 or 80 tracks. Only 360-KB floppy drives have 40 tracks; drives with 720 KB, 1.2 MB, and 1.44 MB capacity all have 80 tracks. Because very few modern PCs have 40-track floppy drives, we recommend that you set this field to Disabled to save time.

Boot Up NumLock Status

Toggle between On or Off to control the state of the NumLock key when the system boots. When toggled On, the numeric keypad generates numbers instead of controlling cursor operations.

Boot Up System Speed

To speed the system boot up (High or Low), the default setting is "High".

Gate A20 Option

Gate A20 refers to the way the system addresses memory above 1 MB (extended memory). When set to Fast, the system chipset controls Gate A20. When set to Normal, a pin in the keyboard controller controls Gate A20. Setting Gate A20 to Fast improves system speed, particularly with OS/2 and Windows.

Typematic Rate Setting

Key strokes repeat at a rate determined by the keyboard controller. When enabled, the typematic rate and typematic delay can be selected. "Disable","Enable"

Typematic Rate (Chars/Sec)

Sets the number of times a second to repeat a key stroke when you hold the key down. "6","8","10","12","15","20","24","30".

Typematic Delay (Msec)

Sets the delay time after the key is held down before it being to repeat the key stroke. "6","8","10","12","15","20","24","30"

Security Option

If you have set a password, select whether the password is required every time the System boots, or only when you enter Setup. "System","Setup"

OS Select For DRAM>64MB

Select the operating system that is running with greater than 64MB or RAM on the system. "Non-OS2","OS2"

Report of No FDD for Windows 95

Set this option to <NO> when using Windows 98 version, or the FDD will not work. "Yes","No"

Shadow

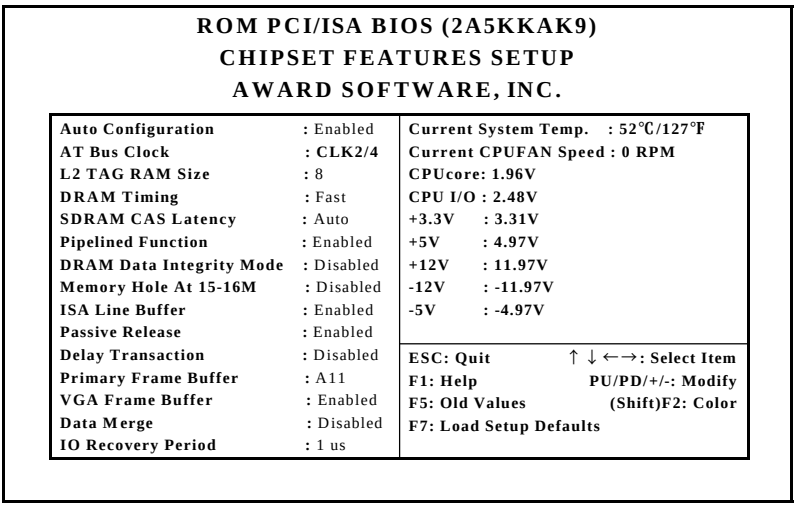
Software that resides in a read-only memory (ROM) chip on a device is called firmware. The AwardBIOS permits shadowing of firmware such as the system BIOS, video BIOS, and similar operating instructions that come with some expansion peripherals, such as, for example, a SCSI adaptor.

Shadowing copies firmware from ROM into system RAM, where the CPU can read it through the 16-bit or 32-bit DRAM bus. Firmware not shadowed must be read by the system through the 8-bit X-bus. Shadowing improves the performance of the system BIOS and similar ROM firmware for expansion peripherals, but it also reduces the amount of high memory (640 KB to 1 MB) available for loading device drivers, etc.

Enable shadowing into each section of memory separately. Many system designers hardwire shadowing of the system BIOS and eliminate a System BIOS Shadow option.

Video BIOS shadows into memory area C0000-C7FFF. The remaining areas shown on the BIOS Features Setup screen may be occupied by other expansion card firmware. If an expansion peripheral in your system contains ROM-based firmware, you need to know the address range the ROM occupies to shadow it into the correct area of RAM.

CHIPSET features setup



The displayed configuration is based on the manufacturer's SETUP DEFAULTS settings.

This section allows you to configure the system based on the specific features of the installed chipset. This chipset manages bus speeds and access to system memory resources, such as SDRAM. It also coordinates communications between the conventional ISA bus and the PCI bus. It must be stated that these items should never need to be altered. The default settings have been chosen because they provide the best operating conditions for your system. The only time you might consider making any changes would be if you discovered that data was being lost while using your system.

Because of the complexity and technical nature of some of the options, not all of the options are described here.

Auto Configuration
Auto Configuration selects predetermined optimal values of chipset parameters. When Disabled, chipset parameters revert to setup information stored in CMOS. Many fields in this screen are not available when Auto Configuration is Enabled.

AT Bus Clock
The chipset generates the ISA bus clock (ATCLK) from an internal division of PCICLK. You can set the speed of the AT bus in terms of a fraction of the CPU clock speed, or at the fixed speed of 7.16 MHz. "CLK2/4","CLK2/6","7.16MHz","CLK2/2","CLK2/3","CLK2/5"

L2 TAG RAM Size
The system uses tag bits to determine the status of data in the cache. Set this field to decide how many RAM size use for TAG, "8","10"

DRAM Timing
The value in this field depends on performance parameters of the installed memory chips (DRAM). Do not change the value from the factory setting unless you install new memory that has a different performance rating than the original DRAMs.

"Fast","Slow","Normal"

SDRAM CAS Latency
When synchronous DRAM is installed, you can control the number of CLKs between when the SDRAMs sample a read command and when the contoller samples read data from the SDRAMs. Do not reset this field from the default value specified by the system designer. "Auto","3","2"

Pipelined Function
When Enabled, the controller signals the CPU for a new memory address before all data transfers for the current cycles are complete, resulting in faster performance. "Disable","Enable"

DRAM Data Integrity Mode
Select Parity or ECC (error-correcting code), according to the type of installed DRAM. "Disabled","Parity","ECC"

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

ISA Line Buffer
The PCI to ISA Bridge has an 8-byte bidirectional line buffer for ISA or DMA bus master memory reads from or writes to the PCI bus. When Enabled, an ISA or DMA bus master can prefetch two doublewords to the line buffer for a read cycle. "Disable","Enable"

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

Delay Transaction
The chipset has an embedded 32-bit posted write buffer to support delay transactions cycles. Select Enabled to support compliance with PCI specification version 2.1. "Disable","Enable"

Primary Frame Buffer
Select a size for the PCI frame buffer. The size of the buffer should not impinge on local memory.

"A11","Disabled","1MB","2MB","4MB","8MB","16MB"

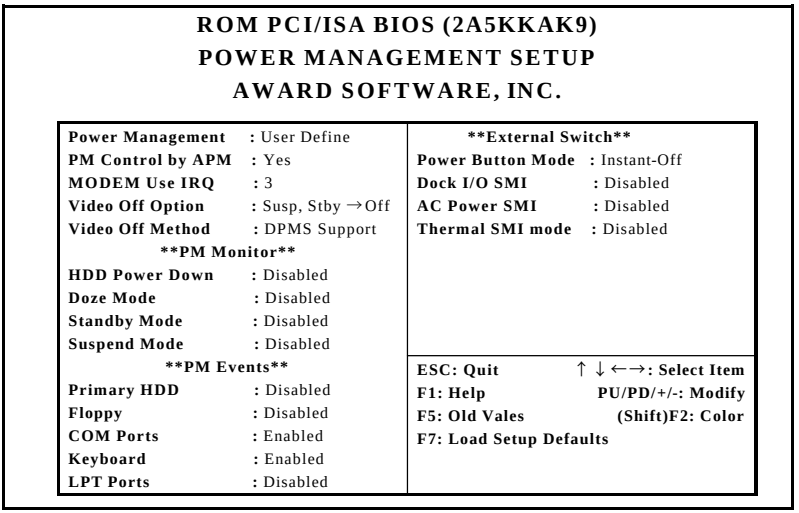
VGA Frame Buffer
When Enabled, a fixed VGA frame buffer from A000h to BFFFh and a CPU-to-PCI write buffer are implemented. "Disable","Enable"

Data Merge
"Disable","Enable"

I/O Recovery Period
The I/O recovery mechanism adds bus clock cycles between PCI-originated I/O cycles to the ISA bus. This delay takes place because the PCI bus is so much faster than the ISA bus.

"0us","1us","2us","3us"

Power management setup



The displayed configuration is based on the manufacturer's SETUP DEFAULTS settings.

Power Management

This option allows you to select the type (or degree) of power saving for Doze, Standby, and Suspend modes.

This table describes each power management mode:

Max Saving	Maximum power savings. Only Available for SL CPUs. Inactivity period is 1 minute in each mode.
User Define	Set each mode individually. Select time-out periods in the section for each mode, below.
Min Saving	Minimum power savings. Inactivity period is 1 hour in each mode (except the hard drive).

PM Control by APM
If Advanced Power Management (APM) is installed on your system, selecting Yes gives better power savings. "Yes","No"

MODEM Use IRQ
Name the interrupt request (IRQ) line assigned to the modem (if any) on your system. Activity of the selected IRQ always awakens the system. "NA","3","4","5","7","9","10","11"

Video Off Option
Selects the power-saving modes during which the monitor goes blank:

Always On: Monitor remains on during power-saving modes.

Suspend Off: Monitor blanked when system enters Suspend mode.

Susp, Stby Off: Monitor blanked when system enters either Suspend or Standby mode.

All Modes Off: Monitor blanked when system enters any power saving mode.

Video Off Method
Determines the manner in which the monitor is blanked.

V/H SYNC+Blank	System turns off vertical and horizontal synchronization ports and writes blanks to the video buffer.
DPMS Support	Select this option if your monitor supports the Display Power Management Signaling (DPMS) standard of the Video Electronics Standards Association (VESA). Use the software supplied for your video subsystem to select video power management values.
Blank Screen	System only writes blanks to the video buffer.

HDD Power Down

After the selected period of drive inactivity, any system IDE devices compatible with the ATA-2 specification or later power manage themselves, putting themselves into an idle state after the specified timeout and then waking themselves up when accessed.

"Disabled","1 Min","2 Min","3 Min","4 Min","5 Min","6 Min","7 Min","8 Min","9 Min","10 Min","11 Min","12 Min","13 Min","14 Min","15 Min"

Doze Mode

After the selected period of system inactivity, the CPU clock throttles to a small percentage of its duty cycle between 10 percent and 25 percent for most chipsets. All other devices still operate at full speed.

"Disabled","1 Min","2 Min","3 Min","4 Min","5 Min","6 Min","7 Min","8 Min","9 Min","10 Min","20 Min","30 Min","40 Min","50 Min","1 Hour"

Standby Mode

After the selected period of system inactivity, the CPU clock stops, the hard drive enters an idle state, and the L2 cache enters a power-save mode. All other devices still operate at full speed.

"Disabled","1 Min","2 Min","3 Min","4 Min","5 Min","6 Min","7 Min","8 Min","9 Min","10 Min","20 Min","30 Min","40 Min","50 Min","1 Hour"

Suspend Mode

After the selected period of system inactivity, the chipset enters a hardware suspend mode, stopping the CPU clock and possibly causing other system devices to enter power management modes.

"Disabled","1 Min","2 Min","3 Min","4 Min","5 Min","6 Min","7 Min","8 Min","9 Min","10 Min","20 Min","30 Min","40 Min","50 Min","1 Hour"

Primary HDD
You can disable monitoring of common interrupt requests of Primary HDD, so they do not generate PM events.

"Disable","Enable"

Floppy
You can disable monitoring of common interrupt requests of Floppy, so they do not generate PM events.

"Disable","Enable"

Com Ports
You can disable monitoring of common interrupt requests of Com Ports, so they do not generate PM events.

"Disable","Enable"

Keyboard
You can disable monitoring of common interrupt requests of Keyboard, so they do not generate PM events.

"Disable","Enable"

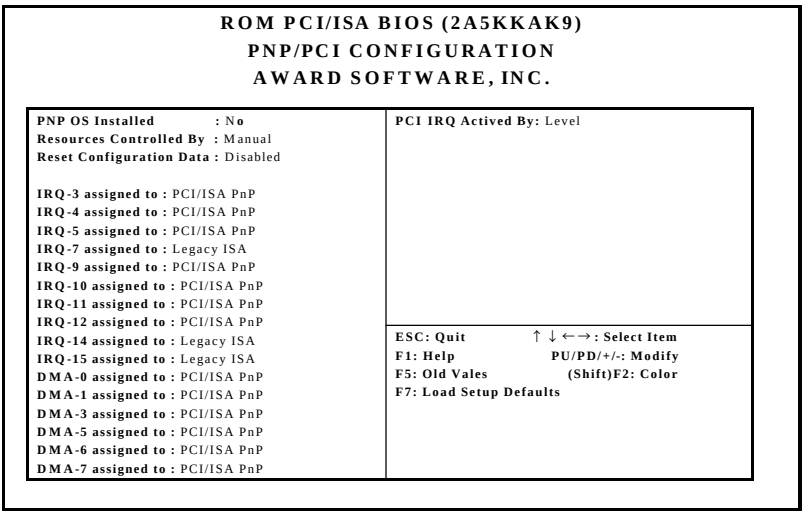
LPT Ports
You can disable monitoring of common interrupt requests of LPT Ports, so they do not generate PM events.

"Disable","Enable"

Power Button Mode
Choose the mode for system turn off.

"Instant-Off","Disabled","4 Sec. -Off"

PNP/PCI configuration setup



The displayed configuration is based on the manufacturer's SETUP DEFAULTS settings.

PNP OS Installed

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

Resources Controlled By

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

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

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

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

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

DMA n Assigned to
When resources are controlled manually, assign each system DMA channel as one of the following types, depending on the type of device using the interrupt:

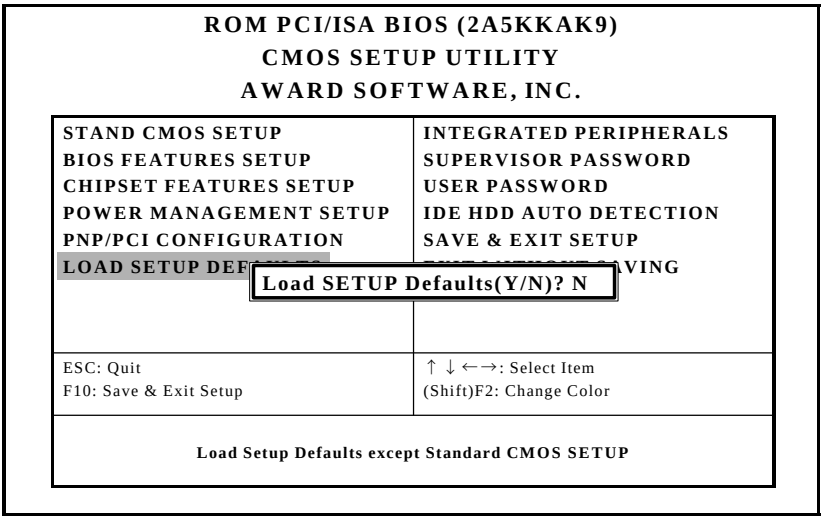
Legacy ISA Devices compliant with the original PC AT bus specification, requiring a specific DMA channel

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

PCI IRQ Activated by
Leave the IRQ trigger set at Level unless the PCI device assigned to the interrupt specifies Edge-triggered interrupts. "Level", "Edge"

Load setup defaults

LOAD SETUP DEFAULTS, on the other hand, provides for maximum system performance. If the stored record created by the setup utility becomes corrupted (and therefore unusable), BIOS defaults will load automatically when you turn the power on.



Integrated peripherals setup

ROM PCI/ISA BIOS (2A5KKAK9)
INTEGRATED PERIPHERALS
AWARD SOFTWARE, INC.

On-Chip Primary IDE	: Enabled	**Onboard IrDA Port**	: Disable
Master PIO	: Auto		
Slave PIO	: Auto		
Master Ultra DMA	: Auto		
Slave Ultra DMA	: Auto	**Onboard Serial Port 3**	: 3E8H
IDE HDD Block Mode	: Enabled	**Serial Port 3 Use IRQ**	: IRQ5
On-Chip USB Controller	: Enabled	**Onboard Serial Port 4**	: 2E8H
USB Keyboard Support	: Disabled	**Serial Port 4 Use IRQ**	: IRQ10
Ring/Wake On LAN Control	: Disabled		
Onboard FDC Controller	: Enabled		
Onboard UART Port 1	: 3F8/IRQ4		
Onboard UART Port 2	: 2F8/IRQ3		
Onboard Parallel Port	: 378/IRQ7		
Parallel Port Mode	: ECPEPP1.9		
ECP Mode Use DMA	: 3		

The displayed configuration is based on the manufacturer's SETUP DEFAULSTS settings.

On-Chip Primary IDE

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

Primary IDE PIO Modes (Master/Slave)

The four IDE PIO (Programmed Input/Output) fields let you set a PIO mode (0-4) for each of up to two IDE devices that the internal PCI IDE interface supports. Modes 0 through 4 provide successively increased performance. In Auto mode, the system automatically determines the best mode for each device.

Primary IDE UDMA Mode (Master/Slave)

UDMA (Ultra DMA) is a DMA data transfer protocol that utilizes ATA commands and the ATA bus to allow DMA commands to transfer data at a maximum burst rate of 33 MB/s. When you select Auto in the four IDE UDMA fields (for each of up to four IDE devices that the internal PCI IDE interface supports), the system automatically determines the optimal data transfer rate for each IDE device.

IDE HDD Block Mode

Select Enabled only if your hard drives support block mode.

On-Chip USB controller

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

USB Keyboard Support

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

Ring/Wake on LAN Control

Enable or disable Ring/Wake on LAN function.

Onboard FDC Controller

Select Enabled if your system has a floppy disk controller (FDC) installed on the system board and you wish to use it. If you install an add-in FDC or the system has no floppy drive, select Disabled in this field.

Onboard UART Ports (1, 2)

Select a logical COM port name and matching address for the first and second serial ports. Select an address and corresponding interrupt for the first and second serial ports.

Onboard Parallel Port
Select a logical LPT port address and corresponding interrupt for the physical parallel port

Parallel Port Mode
Select an operating mode for the onboard parallel (printer) port. Select Normal, Compatible, or SPP unless you are certain your hardware and software both support one of the other available modes.

ECP Mode Use DMA
Select a DMA channel for the port.

Onboard IrDA port
Disable or select a matching address for IRDA function. After selecting a address, please define the following **IRDA IRQ Select** and **IRDA Mode**.

IRDA IRQ Select
Select a corresponding interrupt for IRDA ports.

IRDA Mode
Choose the mode for IRDA. If you choose IRDA 1.1, please define the following **FIR tranceiver type** as HP like or IBM like; and **DMA channel for IRDA 1.1** as 3.

Onboard Serial Port 3.
Select a matching address for the third serial ports.

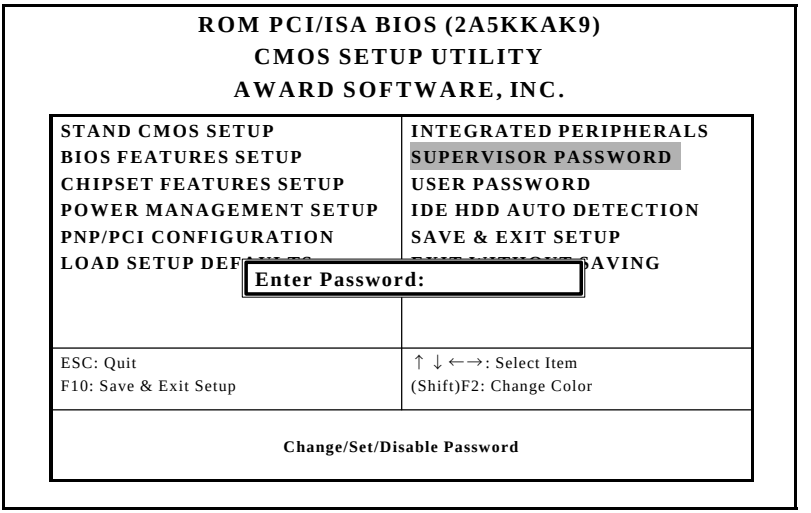
Serial Port 3 Use IRQ.
Select a corresponding interrupt for the third serial ports.

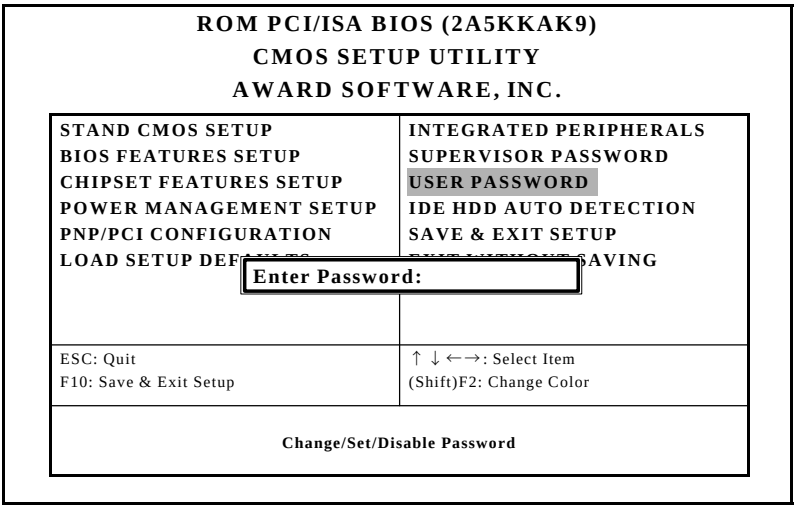
Onboard Serial Port 4.
Select a matching address for the fourth serial ports.

Serial Port 4 Use IRQ.
Select a corresponding interrupt for the fourth serial ports.

Supervisor/User password setting

You can set either SUPERVISOR or USER PASSWORD, or both of them. The difference between the two is that the supervisor password allows unrestricted access to enter and change the options of the setup menus, while the user password only allows entry to the program, but not modify options.





When you select this function, a message appears at the center of the screen:

ENTER PASSWORD:

Type the password, up to eight characters, and press Enter. Typing a password clears any previously entered password from CMOS memory.

Now the message changes:

CONFIRM PASSWORD:

Again, type the password and press Enter.

To abort the process at any time, press Esc.

In the Security Option item in the BIOS Features Setup screen, select System or Setup:

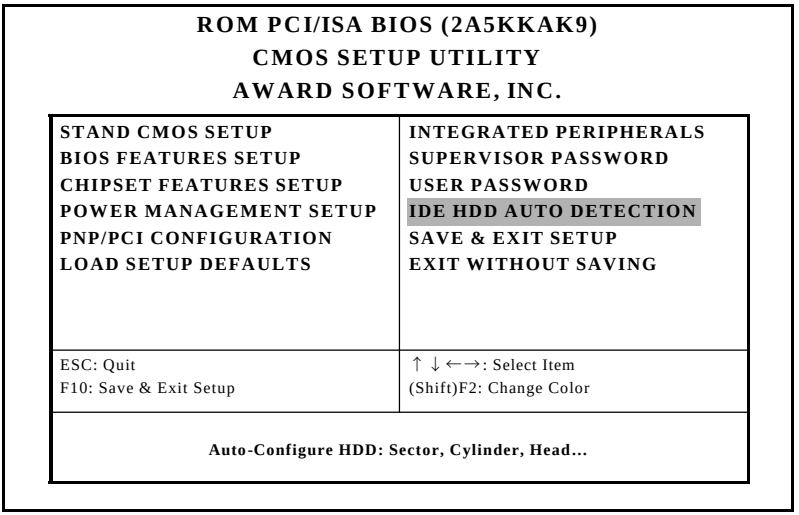
System Enter a password each time the system boots and when ever you enter Setup.

Setup Enter a password when ever you enter Setup.

***NOTE**: To clear the password, simply press Enter when asked to enter a password. Then the password function is disabled.*

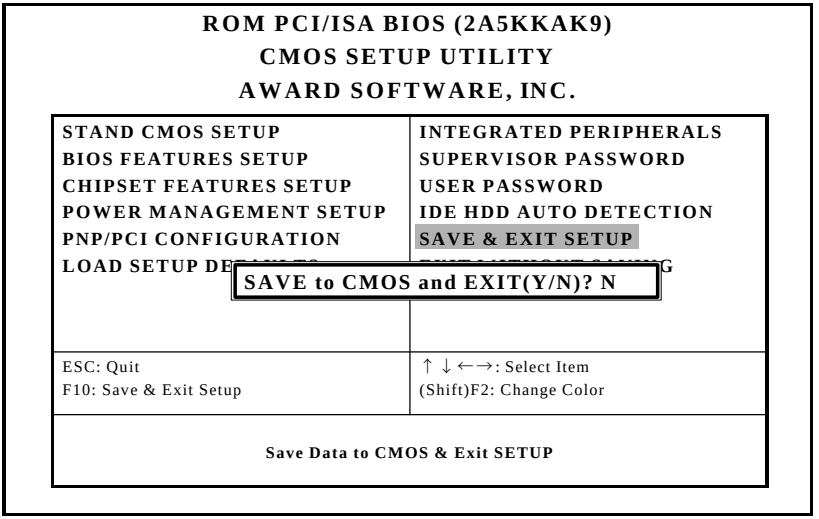
IDE HDD auto detection

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. You need to repeat the setup for each of the IDE combinations:



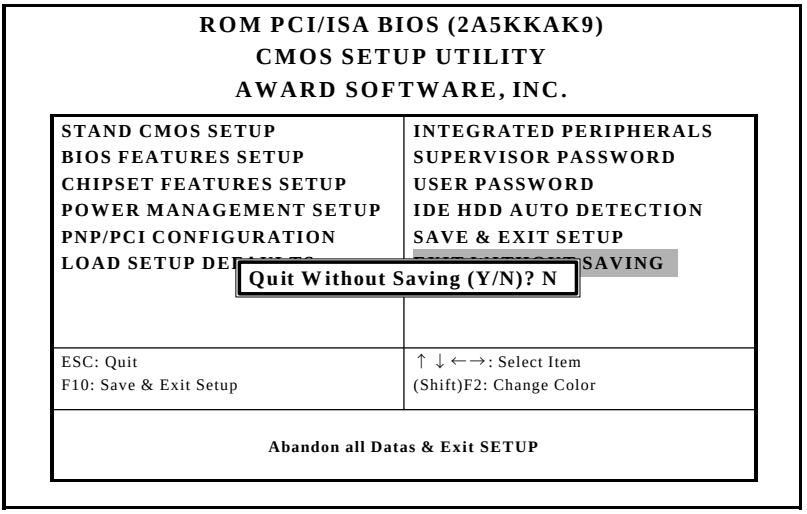
Save & exit setup

If you select this option and press <ENTER>, the values entered in the setup utility 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

Seleting this option and press <Enter> lets you exit the setup program without recording any new values or changing old ones.



CHAPTER 4

Flat Panel/CRT Controller Display Drivers and Utilities

This chapter provides information about:

- Driver types and installation

Software drivers

This chapter describes the operation and installation of the display drivers supplied on the *Supporting CD-ROM* that are shipped with your product.

The onboard VGA adapter is based on the CHIPS VGA Flat Panel/CRT controller and is fully IBM VGA compatible. This controller offers a large set of extended functions and higher resolutions. If you intend to use your VGA adapter in standard VGA modes only, you do not need to install any of these drivers. Since your VGA adapter is fully compatible, it does not require any special drivers to operate in standard modes.

The purpose of the enclosed software drivers is to take advantage of the extended features of the CHIPS VGA Flat Panel/CRT controller.

Hardware configuration

Some of the high-resolution drivers provided in this package will work only in certain system configurations. If a driver does not display correctly, try the following:

1. Change the display controller to CRT-only mode, rather than flat panel or simultaneous display mode. Some high-resolution drivers will display correctly only in CRT mode.
2. If a high-resolution mode is not supported on your system, try using a lower-resolution mode. For example, 1024 x 768 mode will not work on some systems, but 800 x 600 mode is supported on most.

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 from the *Supporting CD-ROM*, you should:

- Know how to copy files from a CD-ROM to a directory on the hard disk
- Understand the MS-DOS directory structure

If you are uncertain about any of these concepts, please refer to the DOS or OS/2 user reference guides for more information *before* you proceed with the installation.

Before you begin

Make sure you know the version of the application for which you are installing drivers. The *Supporting CD-ROM* contain drivers for several versions of certain applications. For your driver to operate properly, you must install the driver for your version of the application program.

Driver installation for Windows 95/98

1. Install Windows® 95/98 as you normally would for a VGA display. Click the **Start** button, go to **Settings** and click on **Control Panel**. Choose the **Display** icon and double click on the icon. In the ***Display Properties*** window, show as figure 1:

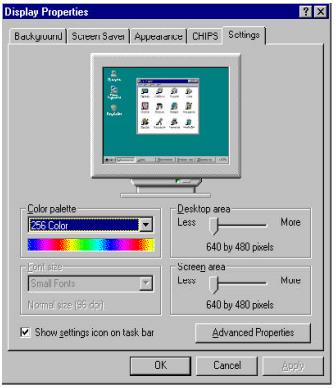


figure 1

Click the setting buttom, then click the Advanced Properties icon into the ***Advanced Display properties*** windows, show as figure2:

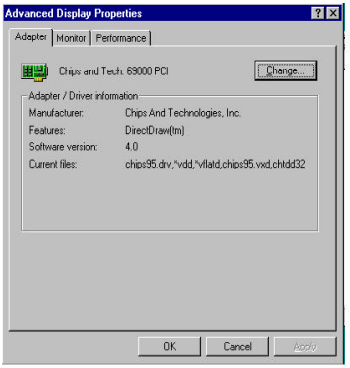


figure 2

click on **Change Display Type**. In the ***Change Display Type*** window, click on the **Change** button under Adapter Type into the select Device window show as figure 3: This will bring up the ***Select Device*** window.

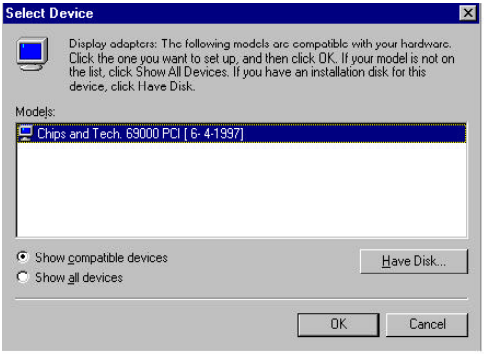


figure 3

2. Place the *Supporting CD-ROM* in your CD-ROM drive.

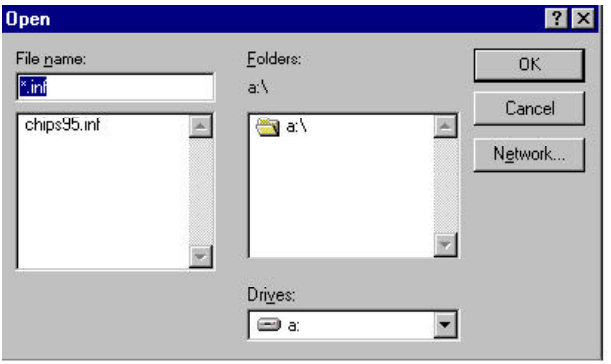


figure 4

In the ***Select Device*** window, click on **Have Disk**, Select **Browse**, and find the Win95(Win98) driver "chips95.inf"("chips98.inf) in the *Supporting CD-ROM*:

Win95:

cd-rom: \Driver\Vga\Win95\chips95.inf and then click OK.

Win98:

cd-rom: \Driver\Vga\Win98\chips98.inf and then click OK.

"**cd-rom**" : the drive letter of your CD-ROM drive

The name of the ***Chips And Tech* "69000 *PCI* "** driver will appear highlighted in the ***Models*** list boxfhow as figure. Click OK to start the driver installation show as figure 5:

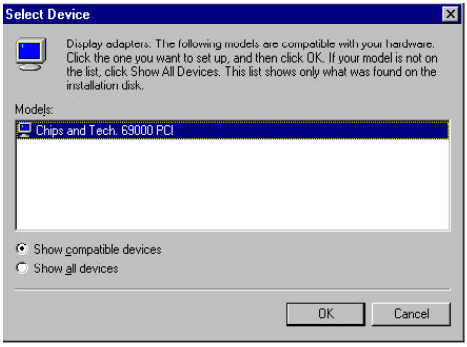


figure 5

3. Once the installation is complete, the ***Advanced display Properties*** window will reappear. Show as figure 6:

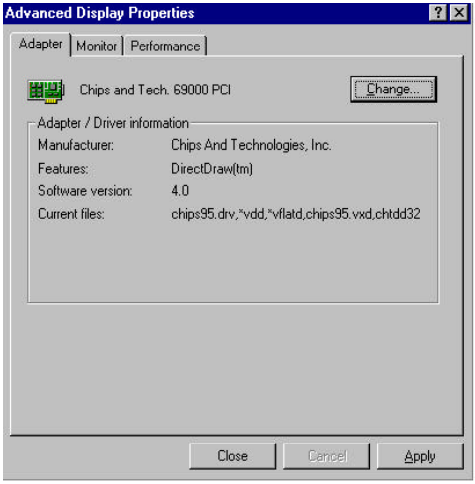


figure 6

Click on close to close the window. Then the ***Display Properties*** window will reappear. Show as figure 7:

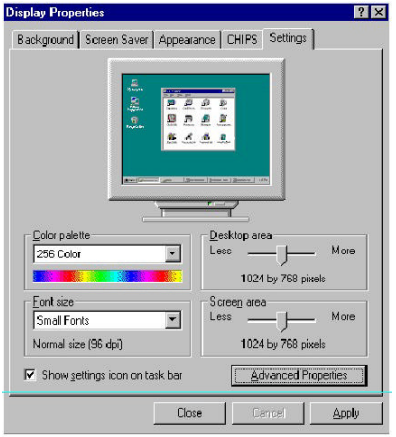


figure 7

Click on **Apply**. Restart the system for the new settings to take effect, show as figure 8:

figure 8

Windows 3.1

These drivers are designed to work with Microsoft Windows Version 3.1. You should install these drivers through Windows.

Driver installation

1. Install Windows as you normally would for a VGA display. Run Windows to make sure that it is working correctly.
2. Place the *Supporting CD-ROM* into your CD-ROM drive. In Windows Program Manager, choose *File* from the Options Menu. Then from the pull-down menu, choose *Run*. At the Command Line prompt, type.

   cd-rom:\Driver\Vga\Win31\setup.exe

   Press the <ENTER> key or click OK to begin the installation.

   "***cd-rom***" : the drive letter of your CD-ROM drive

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**.

3. Press <ENTER> to complete the installation. Once completed, you can find the icon Chips CPL under the Control Panel. The icon allows you to select and load the installed drivers.

OS/2

These drivers are designed to function with the OS/2 Version 4.0, 3.0 and 2.11 operating systems.

To install this driver, do the following steps:

1. Open an OS/2 full screen or windowed session.
2. Place the *Supporting CD-ROM* into your CD-ROM drive.
3. At the OS/2 command prompt, type the following commands to copy the files to the OS/2 drive:

   cd-rom:\Driver\Vga\os2\setup.cmd

   "***cd-rom***" : the drive letter of your CD-ROM drive

When the Setup Program is completed, you will need to perform a shut-down and then restart the system in order for changes to take effect.

A log of the information output during the install can be found

in <root>:\OS2\INSTALL\DISPLAY.LOG

4. After restarting the system, perform the following steps:

   1. Open the OS/2 System folder.
   2. Open the System Setup folder.
   3. Open the Display Driver Install Object.

This step will execute the Display Driver Installation (DSPINSTL) utility program to finish installation of the new drivers.

   4. When the Display Driver Install window appears, select Primary Display and then select OK.
   5. When the Primary Display Driver List window appears, select "Chips and Technologies 69000" from the list of adapter types, then select OK or install the video driver.

6. When the installation is complete, you will need to shut down and then restart the system for the changes to take effect. Make sure to remove the installation diskette before restarting the system.

Windows NT 3.51

These drivers are designed to work with Microsoft® Windows®.

Driver installation

1. Install Windows® NT 3.51 as you normally would for a **VGA** display. Click the **Star** buttom, go to **Settings** and click on **Control Panel** icon. Then choose the **Display** and double click on the icon. In the **Display Properties** window, click the **Setting** buttom, then click the **Display Type** buttom into the **Display Type** windows, then click on **Change** buttom from the **Adapter Type** icon. And click on **Have Disk** buttom in the change display window.
2. Place the *Supporting CD-ROM* into your CD-ROM drive.

   and type:

   cd-rom: \drive\Vga\windows.Nt\nt351\Oemsetup.inf

   "**cd-rom**" : the drive letter of your CD-ROM drive

   Select the adapter "Chips and Tech 69000PCI" and click OK.

   Click on Install to install the selected driver. Once the installation is complete, shut down and restart the system.

Windows NT 4.0

Driver installation

1. Install Windows® NT 4.0 as you normally would for a **VGA** display. Click the **Star** buttom, go to **Settings** and click on **Control Panel** icon. Then choose the **Display** and double click on the icon. In the **Display Properties** window, click the **Setting** buttom, then click the **Display Type** buttom into the **Display Type** windows, then click on **Change** buttom from the **Adapter Type** icon. And click on **Have Disk** buttom in the change display window.

2. Place the *Supporting CD-ROM* into your CD-ROM dirve. In the ***Select Device*** window, click on **Have Disk**, select "**Browse**" and find the NT 4.0 driver from:

   cd-rom : \dirver\Vga\windows.Nt\nt40\Oemsetup.inf

   "**cd-rom**" : the drive letter of your CD-ROM drive

   and then click OK. The name of the ***Chips and Technologies, Inc***. ***Video Controller*** driver will appear highlighted in the Modules list box. Select Chips and Tech. 69000 and Click **OK**. Click **OK** to start the driver installation.

3. Once the installation is complete, the ***Change Display Type*** window will reappear. Click on close to close the window. Then the ***Display Properties*** window will reappear. Click on **Apply**. Restart the system for the new settings to take effect.

Windows 2000

Driver installation

1. Click the **"Start"** button, then select the "**Control Panel"** and click on it.

2. Click on the **"Display"** icon to start the Display Properties window.

3. Click on the **"Settings"** tab, and then click on **"Advanced..."** button.

4. Select the **"Adapter"** tab, then the **"Properties"** button found there.

5. Select the **"Driver"** tab, then the **"Update Driver..."** button.

6. Select the radio button that begins **"Display a list of the known..."** and press the **"Next"** button.

7. Click **"Have Disk"** botton and select the location of the driver files.
   cd-rom: \Driver\Vga\Win 2K\chips2k.inf and then click OK.
   "**cd-rom**" : the drive letter of your CD-ROM drive

8. Select the chips2k.inf file. Click **"Next"**

9. You may need to shutdown and reboot the system for the changes to take effect. Follow the prompts.

   When the system has restarted, the default graphics mode (usually 640x480x256color) has been automatically selected.

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Windows XP

Driver installation

1. Click the **"Start"** button, then select the "**Control Panel"** and click on it.

2. Click on the **"Display"** icon to start the Display Properties window.

3. Click on the **"Settings"** tab, and then click on **"Advanced..."** button.

4. Select the **"Adapter"** tab, then the **"Properties"** button found there.

5. Select the **"Driver"** tab, then the **"Update Driver..."** button.

6. Select the radio button that begins **"Install from a list or..."**
   and press the **"Next"** button.

7. Click the **"Don't search..."** radio button and click **"Next".**

8. Click **"Have Disk"** and then **"Browse"** to the location of the driver files.
   cd-rom: \Driver\Vga\Win XP\chipsxp.inf and then click OK.
   "**cd-rom**" : the drive letter of your CD-ROM drive

9. Select the chipsxp.inf file. Click **"Open".** Click **"OK"**.

10. Click **"Next"**. If Logo Testing Dialog comes up click **"Continue Anyway"**.

11. You may need to shutdown and reboot the system for the changes to take effect. Follow the prompts.

    When the system has restarted, the default graphics mode (usually 640x480x256color) has been automatically selected.

CHAPTER 5

Ethernet Software Configuration

This chapter describes how to configure the Etherent Card to match your application requirements.

Ethernet Software Configuration

Installing the Ethernet Drivers

Follow these steps to install the Ethernet drivers:

Driver installation

1. Excute the installation wizard named "SETUP" in the following directory:

   cd-rom : \Driver\LAN\Setup.exe

   "***cd-rom***" : the drive letter of your CD-ROM drive

2. After the ***Realtek 8139/810x Family Drive Installation*** window shows up, click on the **Next** button.

3. Simply follow the instructions to finish the installation.

CHAPTER 6

Audio Setup

This PCM-5896 is equipped with an audio interface that records and playback CD-quality audio. This chapter provides instructions for installing the software drivers on the included CDROM.

Introduction

The PCM-5896 Rev. C on board audio interface provides high-quality stereo sound and FM music synthesis (ESFM) by using the ESS Solo-1 audio controller from ESS Labs, Inc. The audio interface can record, compress, and play back voice, sound, and music with built-in mixer control.

The PCM-5896 Rev.C on board audio interface also supports the Plug and Play (PnP) standard and provides PnP configuration for the audio, FM, and MPU-401 logical devices. It is compatible with Sound Blaster®; Sound Blaster Pro® version 3.01, voice and music functions. The ESFM synthesizer is register compatible with the OPL3 and has extended capabilities.

Setting Up in Windows 95/98/ME/XP

The Supporting CD-ROM contains the Windows 95/98/ME/XP drivers. Please see the online help for details.

Note: **Refer to your Windows 95/98/ME/XP manual or online help for any questions on Windows 95/98/ ME.**

Installing the Drivers and the Application

After turning on the system, Windows 95/98/ME/XP begins loading and starts detecting new hardware installed on the system.

1. When Windows 95/98/ME/XP detects the presence of the onboard audio chip, it begins to build the ESS Solo-1 driver database. The New Hardware Found dialog box displays.
2. Select Driver from disk provided by hardware manufacturer and click on OK. Windows 95/98/ME/XP prompts you for the driver disk.
3. Specify the path of the ***Supporting CD-ROM*** as follows, then click on OK. The system will copy the necessary driver files to your hard disk drive.

   ***cd-rom*:\Driver\Audio\Win 95-98 (or Win 98SE, Win ME, Win XP)**

   "*cd-rom*": the driver letter of your CD-ROM drive

Tip*: Prepare the Windows 95/98/ME/XP CD-ROM disk before setting up the onboard audio. Windows 95/98/ME will prompt you to insert the Windows 95/98/ME CD-ROM disk when you install the joystick or MIDI device.*

Note*: If the file being copied is older than the file currently existing in your system, we suggest you to keep the existing file.*

4. Windows 95/98/ME makes changes to the system settings and begins detecting the following new hardware components:

- Gameport Joystick
- ES1938 PCI Audio Drive
- ES1938 DOS Emulation

5. Upon initial installation, the setup process begins setting up the software.
6. Windows 95/98/ME makes final changes to the system settings, and you will be prompted to re-boot the system.

Setting Up in Windows 3.1

Installing the Audio Drivers

Follow these steps to install the audio drivers:

Driver installation

1. Excute the installation wizard named "SETUP" in the following directory:

   cd-rom : \Driver\Audio\Win 3.1\Setup.exe

   "***cd-rom***" : the drive letter of your CD-ROM drive

2. After the ***ESS Solo-1 Audio Drive Installation*** window shows up, click on the **Next** button.

3. Simply follow the instructions to finish the installation.

Setting Up in NT4.0

Installing the Audio Drivers

Follow these steps to install the audio drivers:

Driver installation

1. Excute the installation wizard named "SETUP" in the following directory:

   ***cd-rom* : \Driver\Audio\Win NT40\Setup.exe**

   "*cd-rom*" : the drive letter of your CD-ROM drive

2. After the ***ESS Solo-1 Audio Drive Installation*** window shows up, click on the **Next** button.

3. Simply follow the instructions to finish the installation.

Setting Up in Windows 2000

Installing the Audio Drivers

Follow these steps to install the audio drivers:

Driver installation

1. Excute the installation wizard named "SETUP" in the following directory:

   ***cd-rom* : \Driver\Audio\Win 2K\Setup.exe**

   "*cd-rom*" : the drive letter of your CD-ROM drive

2. After the ***ESS Solo-1 Audio Drive Installation*** window shows up, click on the **Next** button.

3. Simply follow the instructions to finish the installation.

APPENDIX A

Programming the Watchdog Timer

The mainboard 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 stand-alone and unmanned environments.

Programming the watchdog timer

How to program the WATCHDOG TIMER

1. To set the time-out interval of watchdog timer:

   -- output the desired value to port **0x443**. Since the data is of 1 byte, the maximum value will be 255. In our design 2 ~ 255 will denote 2 ~ 255 sec.

   outportb(0x443, 30); // set watchdog to 30 seconds

2. To set the time-out event:

   -- output data to **prot 0x444,**

   0: reset system

   1, 2, 3: IRQ 10, 15, 11 respectively

   4: NMI
   e.g.
   outportb(0x444, 0); // set time-out event to reset-system

3. To disable watchdog timer:

   -- output value 0 to port 0x443
   outportb(0x443, 0); // disable watchdog timer

4. To ebable or refresh watchdog timer(the watchdog timer will return to its initial value, then count down):

   -- access the I/O port ***0x443***, e.g.
   outportb(0x443, data); // refresh watchdog timer

   * note: if you want to refresh the watchdog timer, you have to disable it first.

Demo program

```
outportb(0x444, 0):          // set time-out event to reset-system
outportb(0x443x 10);         // set time-out interval to 10 seconds
customer_job();              // execute your job here, be sure your
                                job will finished within 10 seconds
outportb(0x443, 0);          //  refresh watchdog timer, otherwise
                                the system will reset after time-out
outputb(0x443, 20);          //  set time-out interval to 20 seconds
another_job();               // another job finished in 20 seconds
outportb(0x443, 0)           // disable watchdog timer
...
...
```

APPENDIX B

Installing PC/104 Modules

This appendix provides instructions for installing PC/104 modules.

Installing PC/104 modules

The PCM-5896'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-3115B** PCMCIA Module (two-slot)
- **PCM-3420** PC/104 Fast SCSI Module
- **PCM-3600** PC/104 Fax/Modem 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-3910** Breadboard Module
- **PCM-3810** Solid State Disk Module

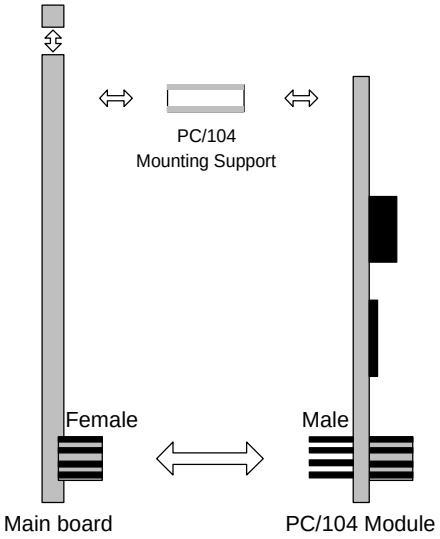
Installing these modules on the PCM-5896 is a quick and simple operation. The following steps show how to mount the PC/104 modules:

Step1 Remove the PCM-5896 from your system, paying particular attention to the safety instructions already mentioned above.

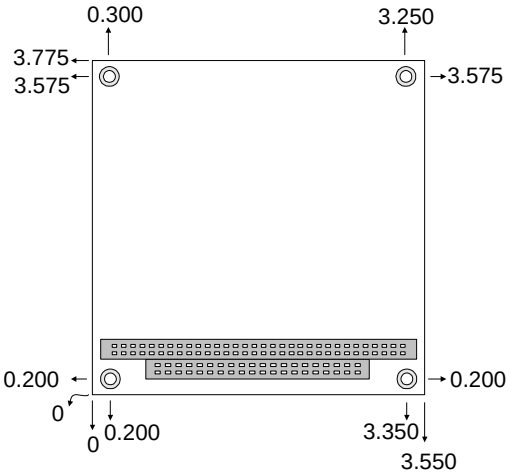
Step2 Make any jumper or link changes required to the SBC now. Once the PC/104 module is mounted, you may have difficulty in accessing these.

Step3 Mount the PC/104 module onto the SBC. Do this by pressing the module firmly but carefully onto the mounting connectors.

Step4 Secure the PC/104 module onto the SBC using the four mounting spacers and srews.



PC/104 Module Mounting Diagram



PC/104 module dimenstions (inches ? %)

APPENDIX C

Optional Extras

PCM-10489-5 Wiring Kit

The cable kit PCM-10489-5 includes the following cables:

Part No.	Cable description	Termination connector
1701440350	2.5" and 1.8" IDE	44-pin, 2 mm, female IDC (350 mm)
1701440500	3.5" IDE (40P)	40-pin, 2.54 mm, female IDC (500 mm)
1701340700	Dual floppy, 3.5" and 5.25" (34P)	34-pin dual floppy
1701260301	Parallel port	25-pin female DSUB
1701080160	Network 10/100BASE-T	RJ-45 extend cable
1701150150	VGA CRT	15-pin DSUB
1700080201	Keyboard and PS/2 mouse	5-pin circular DIN 6-pin circular DIN
1703040301	Peripheral power (-5V and -12V)	4 conductor
1701080300	Front panel	8-conductor pigtail
1701400220	RS-232 Serial Port, 4 COM Port	40 pin, 2.54 mm
1700140200	Audio Input/Output & TV Output	Speaker, Line Out, Line In, Mic In, TV Output, S Terminal

Optional USB Cable

Optional USB Cable part no. 1709080150