PCA-6155V

Full-size Pentium® PICMG
PCI/ISA-bus CPU card
with VGA

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Packing List

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

- 1 PCA-6155V all-in-one single board computer

- 1 utility disk with IDE utility programs

- 6 utility disks with SVGA utility programs and drivers for Windows 3.1/95/NT and OS/2

- 1 hard disk drive (IDE) interface cable (40 pin)

- 1 floppy disk drive interface cable (34 pin)

- 1 parallel port adapter (26 pin) and COM2 adapter (9 pin) kit

- 1 6-pin mini-DIN keyboard & PS/2 mouse adapter

- 1 warranty certificate

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

Additional Information and Assistance

1. Visit the Advantech web sites at **www.advantech.com** or **www.advantech.com.tw** where you can find the latest information about the product.

2. Contact your distributor, sales representative, or Advantech's customer service center for technical support if you need additional assistance. Please have the following information ready:

   - Product name and serial number

   - Description of your peripheral attachments

   - Description of your software (operating system, version, application software, etc.)

   - Complete description of the problem

   - Exact wording of any error messages

Safety Instructions

1. Read these safety instructions carefully.

2. Keep this user's manual for later reference.

3. Disconnect this equipment from any AC outlet before cleaning. Do not use liquid or spray detergents for cleaning. Use a damp cloth.

4. For pluggable equipment, the power outlet must be installed near the equipment and must be easily accessible.

5. Keep this equipment away from humidity.

6. Put this equipment on a reliable surface during installation. Dropping it or letting it fall could cause damage.

7. The openings on the enclosure are for air convection. Protect the equipment from overheating. DO NOT COVER THE OPENINGS.

8. Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.

9. Position the power cord so that people cannot step on it. Do not place anything over the power cord.

10. All cautions and warnings on the equipment should be noted.

11. If the equipment is not used for a long time, disconnect it from the power source to avoid damage by transient over-voltage.

12. Never pour any liquid into an opening. This could cause fire or electrical shock.

13. Never open the equipment. For safety reasons, the equipment should be opened only by qualified service personnel.

14. If any of the following situations arises, get the equipment checked by service personnel:

    a. The power cord or plug is damaged.

    b. Liquid has penetrated into the equipment.

    c. The equipment has been exposed to moisture.

    d. The equipment does not work well, or you cannot get it to work according to the user's manual.

    e. The equipment has been dropped and damaged.

    f. The equipment has obvious signs of breakage.

15. DO NOT LEAVE THIS EQUIPMENT IN AN UNCONTROLLED ENVIRONMENT WHERE THE STORAGE TEMPERATURE IS BELOW 20° C (-4° F) OR ABOVE 60° C (140° F). IT MAY DAMAGE THE EQUIPMENT.

The sound pressure level at the operator's position according to IEC 704-1:1982 is equal to or less than 70 dB(A).

DISCLAIMER: This set of instructions is given according to IEC 704-1. Advantech disclaims all responsibility for the accuracy of any statements contained herein.

Wichtige Sicherheishinweise

1. Bitte lesen sie Sich diese Hinweise sorgfältig durch.

2. Heben Sie diese Anleitung für den späteren Gebrauch auf.

3. Vor jedem Reinigen ist das Gerät vom Stromnetz zu trennen. Verwenden Sie Keine Flüssig-oder Aerosolreiniger. Am besten dient ein angefeuchtetes Tuch zur Reinigung.

4. Die NetzanschluBsteckdose soll nahe dem Gerät angebracht und leicht zugänglich sein.

5. Das Gerät ist vor Feuchtigkeit zu schützen.

6. Bei der Aufstellung des Gerätes ist auf sicheren Stand zu achten. Ein Kippen oder Fallen könnte Verletzungen hervorrufen.

7. Die Belüftungsöffnungen dienen zur Luftzirkulation die das Gerät vor überhitzung schützt. Sorgen Sie dafür, daB diese Öffnungen nicht abgedeckt werden.

8. Beachten Sie beim AnschluB an das Stromnetz die AnschluBwerte.

9. Verlegen Sie die NetzanschluBleitung so, daB niemand darüber fallen kann. Es sollte auch nichts auf der Leitung abgestellt werden.

10. Alle Hinweise und Warnungen die sich am Geräten befinden sind zu beachten.

11. Wird das Gerät über einen längeren Zeitraum nicht benutzt, sollten Sie es vom Stromnetz trennen. Somit wird im Falle einer Überspannung eine Beschädigung vermieden.

12. Durch die Lüftungsöffnungen dürfen niemals Gegenstände oder Flüssigkeiten in das Gerät gelangen. Dies könnte einen Brand bzw. elektrischen Schlag auslösen.

13. Öffnen Sie niemals das Gerät. Das Gerät darf aus Gründen der elektrischen Sicherheit nur von authorisiertem Servicepersonal geöffnet werden.

14. Wenn folgende Situationen auftreten ist das Gerät vom Stromnetz zu tren-nen und von einer qualifizierten Servicestelle zu überprüfen:

    a - Netzkabel oder Netzstecker sind beschädigt.

    b - Flüssigkeit ist in das Gerät eingedrungen.

    c - Das Gerät war Feuchtigkeit ausgesetzt.

    d - Wenn das Gerät nicht der Bedienungsanleitung entsprechend funktioni ert oder Sie mit Hilfe dieser Anleitung keine Verbesserung erzielen.

    e - Das Gerät ist gefallen und/oder das Gehäuse ist beschädigt.

    f - Wenn das Gerät deutliche Anzeichen eines Defektes aufweist.

Der arbeitsplatzbezogene Schalldruckpegel nach DIN 45 635 Teil 1000 beträgt 70dB(A) oder weiger.

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Contents

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Hardware Configuration

This chapter gives background information on the PCA-6155V. It then shows you how to configure the card to match your application and prepare it for installation into your PC.

Sections include:

- Specifications

- Board layout: dimensions

- Board layout: jumper locations

- Board layout: connector locations

- Safety precautions

- Jumper settings

- Installing memory (SIMMs, DIMMs)

1.1 Introduction

The PCA-6155V is a cost-effective, all-in-one single board Pentium® processor-based CPU card which can release the Pentium processor's full potential and provide unprecedented performance compared to current 64-bit processor board. The PCA-6155V offers all the functions of an industrial computer on a single board, full-size CPU card. This card uses an Intel Pentium, Pentium MMX, AMD K5, AMD K6, Cyrix M1 or Cyrix MX processor. The card accepts up to 256 MB DRAM. It also supports on-board 512 KB PB-SRAM 2nd level cache.

The PCA-6155V uses a single-chip solution, allowing on-board DRAM to be shared with the built-in VGA controller. In this configuration, the chipset always acts as the arbiter between memory bus masters. This system ensures efficient memory allocation while substantially reducing the overall system cost.

On-board features include 512 KB 2nd level cache memory, one RS-232 port, one RS-232/422/485 port, one multi-mode parallel (ECP/EPP/SPP) port, a floppy drive controller and a keyboard and PS/2 mouse interface. The built-in high speed PCI IDE controller supports both PIO and DMA bus master modes, enabling data transfer rates in excess of 33 MB/second. Up to four IDE devices can be connected, including large hard disks (up to 8 GB), CD-ROM drives (CD-ROM bootable), tape backup drives and other IDE devices. The PCA-6155V also supports two USB ports and one infrared port.

The PCA-6155V also features power management to minimize power consumption. It complies with the "Green Function" standard and supports three types of power saving features: Doze mode, Standby mode and Suspend mode. A watchdog timer can automatically reset the system or generate an interrupt should the system stop due to a program bug or EMI.

1.2 Specifications

Standard SBC functions

- **CPU:** Intel Pentium®, Pentium MMX, AMD K5, AMD K6, Cyrix M1, Cyrix MX, or IDT Win Chip C6

- **BIOS:** Award 128 KB (1 Mbit) memory; supports plug and play

- **Chipset:** SiS5598

- **L2 cache:** On-board 512 KB synchronous (pipeline burst) SRAM

- **Green function:** Features power management option via BIOS, activated by keyboard or mouse activity. Supports doze, sleep and suspend modes. APM 1.1 compliant

- **Memory:**
  - Two 72-pin SIMM sockets. Support 32-bit FPM or EDO DRAM with memory capacity from 2 ~ 128 MB.
  - Two 168-pin DIMM sockets. Support 64-bit 3.3 V SDRAM with memory capacity from 8 ~ 256 MB.

- **EIDE interface:** Handles up to two IDE HDDs or other IDE devices. Supports PIO mode 4 and Ultra DMA mode

- **FDD interface:** Supports up to two floppy disk drives

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

- **Serial ports:** Two 16C550 UARTs, one RS-232, one RS-232/422/485 interface

- **Watchdog timer:** Can generate a system reset or IRQ 11. Software enabled/disabled. Time interval is from 1 to 62 seconds, jumperless with run-time setup

- **Keyboard/mouse connector:** 6-pin mini-DIN connector on the mounting bracket eases connection to a keyboard or PS/2 mouse. An on-board keyboard pin header connector is also available

- **I/O bus expansion:** PC/104 connector with face-up installation

- **USB interface:** Two USB connectors with fuse protection. Complies with USB specification 1.0

• **Infrared port:** IrDA. Transfer rate up to 115 Kbps. I/O port programmable to COM1 (3F8), COM2 (2F8), COM3 (3E8) or COM4 (2E8)

VGA interface

• **Chipset:** SiS5598 built-in VGA function

• **Architecture:** Universal memory architecture

• **Display memory:** Share system RAM 1 MB ~ 4 MB

SSD function

• **Supports M-System's DiskOnChip® 2000 Flash Disk up to 72 MB**

Mechanical and environmental specifications

• **Board size:** 338 x 122 mm

• **Max. power requirements**: +5 V (4.75 ~ 5.25 V) @ 7 A

• **Operating temperature**: 0 ~ 60° C (32 ~ 140° F)

• **Board weight**: 0.5 kg (1.2 lb)

1.3 Board Layout: Dimensions
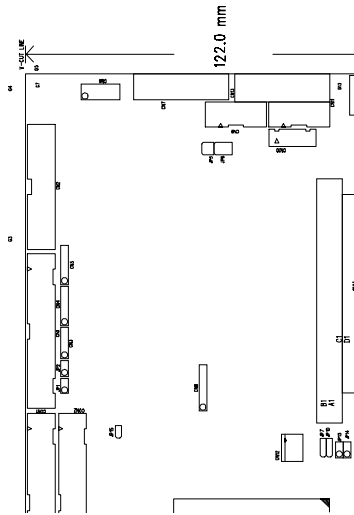
Figure 1-1: PCA-6155V board layout: dimensions

1.4 Jumpers and Connectors

On-board connectors link it to external devices such as hard disk drives, a keyboard, or floppy drives. In addition, the board has jumpers for configuring your board for specific applications.

The table below lists the function of each of the board's jumpers and connectors. Later sections in this chapter give instructions on setting jumpers and detailed information on each jumper setting. Chapter 2 gives instructions for connecting external devices to your card.

Table 1-1: PCA-6155V jumpers

Number	Function
JP1	HDD/LED
JP2	Hardware reset
JP3	CPU external (bus) frequency selection
JP4	CPU core voltage selection
JP5	DiskOnChip® 2000 Flash disk memory segment
JP6	COM2 RS-232/422/485 selection
JP7	Watchdog timer selection
JP8	Cache mode
JP12	CPU clock ratio selection
JP15	CMOS clear selection

Table 1-2: PCA-6155V connectors

Number	Function
CN1	Floppy disk connector
CN2	Parallel port
CN3	Speaker connector
CN4	Power LED and keyboard lock
CN5	IR port
CN6	USB connector
CN7	VGA connector
CN9	COM2 RS-422/485 port
CN10	External keyboard
CN11	COM2 RS-232 port
CN13	COM1 port
CN14	PC/104 A, B, C, D
CN15	Fan power
CN16	PS/2 mouse and keyboard

Please refer to Appendix C for pin assignments.

1.5 Board Layout: Jumper Locations

JP5: DiskOnChip®
2000 Flash disk
memory segment

JP6: COM2
RS-232/422/485
selection

JP2: Hardware reset

JP1: HDD/LED

JP15: CMOS clear
selection

JP7: Watchdog
timer selection

JP3: CPU external
(bus) frequency
selection

JP8: Cache mode

JP12: CPU clock
ratio selection

JP4: CPU core
voltage selection
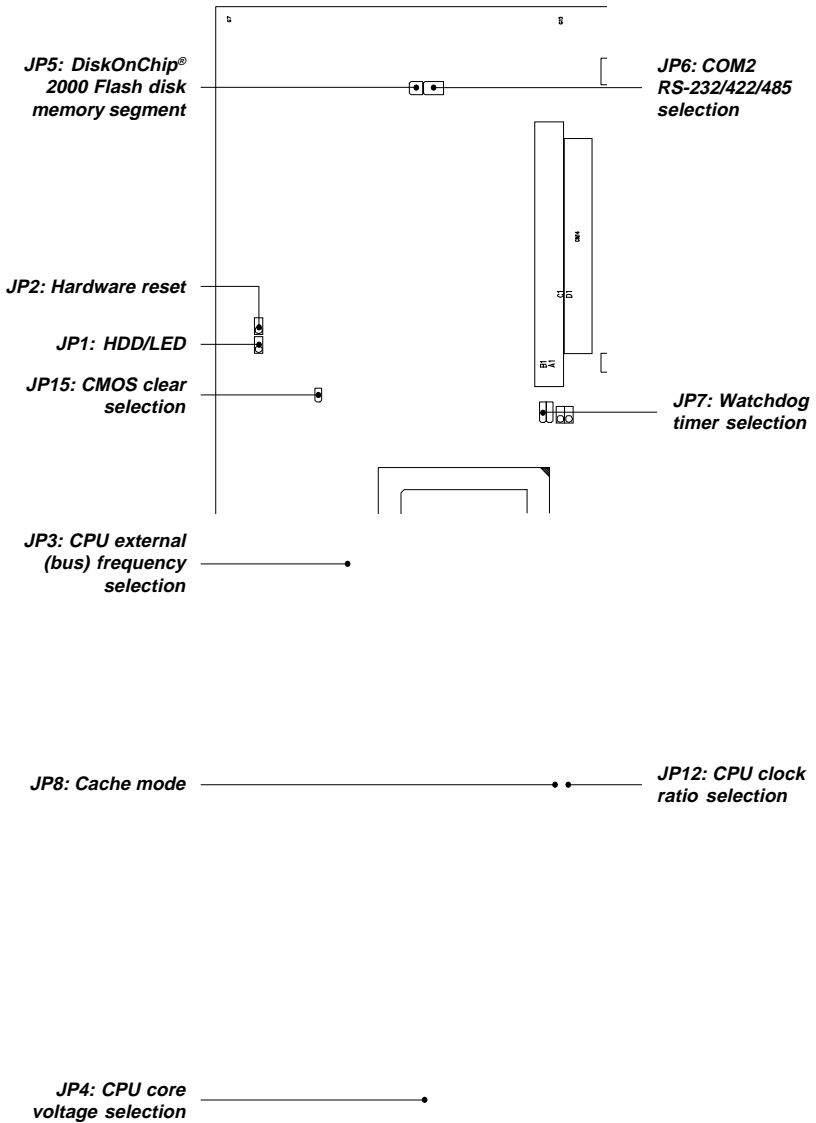
Figure 1-2: PCA-6155V board layout: Jumper locations

1.6 Board Layout: Connector Locations

CN6: USB connector

CN7: VGA connector

CN9: COM2 RS-422/485 port

CN2: Parallel port

CN5: IR port

CN4: Power LED and keyboard lock

CN3: Speaker connector

CN1: Floppy disk connector

CON1: Enhanced IDE primary port

CON2: Enhanced IDE secondary port

CN16: PS/2 mouse and keyboard

CN13: COM1 port

CN11: COM2 RS-232 PORT

CN10: External keyboard

CN14: PC/104 A, B, C, D

CN15: Fan power
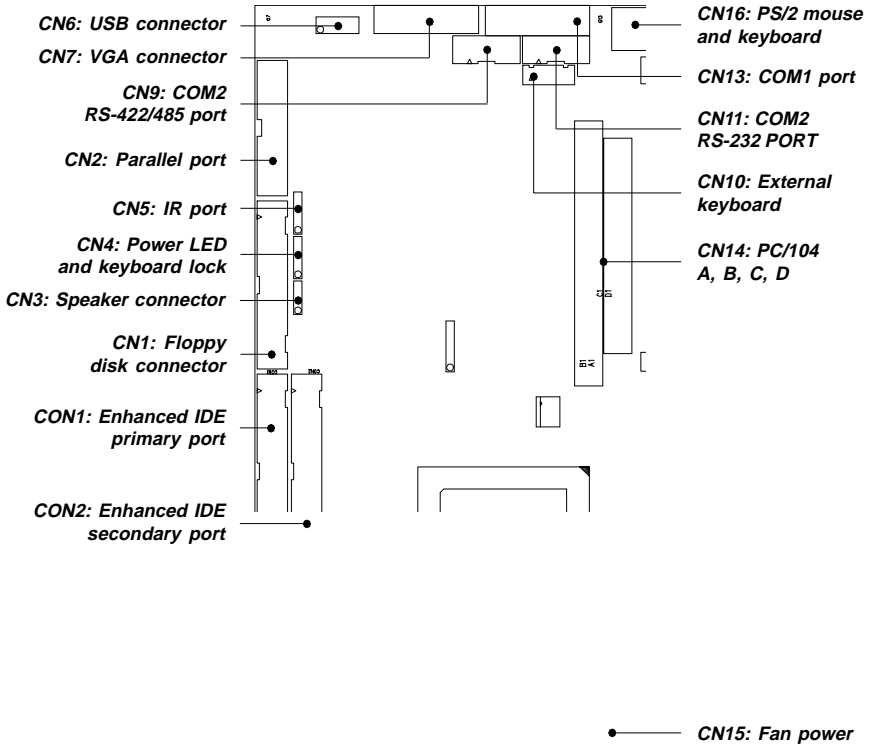
Figure 1-3: PCA-6155V board layout: Connector locations

1.7 Safety Precautions

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

1. To avoid electric shock, always disconnect the power from your PC chassis before you work on it. Don't touch any components on the CPU card or other cards while the PC is on.

2. Disconnect power before making any configuration changes. The sudden rush of power as you connect a jumper or install a card may damage sensitive electronic components.

3. Always ground yourself to remove any static charge before you touch your CPU card. Be particularly careful not to touch the chip connectors. Modern integrated electronic devices, especially CPUs and memory chips, are extremely sensitive to static electric discharges and fields. Keep the card in its antistatic packaging when it is not installed in the PC, and place it on a static dissipative mat when you are working with it. Wear a grounding wrist strap for continuous protection.

1.8 Jumper Settings

This section tells how to set the jumpers to configure your card. It gives the card default configuration and your options for each jumper. After you set the jumpers and install the card, you will also need to run the BIOS Setup program (discussed in Chapter 3) to configure the serial port addresses, floppy/hard disk drive types and system operating parameters. Connections, such as hard disk cables, appear in Chapter 2.

For the locations of each jumper, see the board layout diagram depicted earlier in this chapter.

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 cap (often protected by a plastic cover) that slides over the pins to connect them. To "close" a jumper you connect the pins with the cap. To "open" a jumper you remove the cap. Sometimes a jumper will have three pins, labeled 1, 2 and 3. In this case you connect either pins 1 and 2 or 2 and 3.

Open	**Closed**	**Closed 2-3**
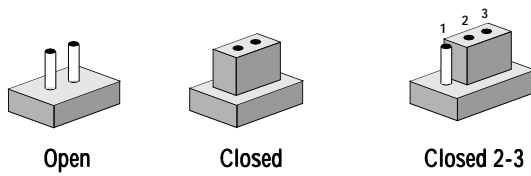
The jumper settings are schematically depicted in this manual as follows:

Open	**Closed**	**Closed 2 - 3**
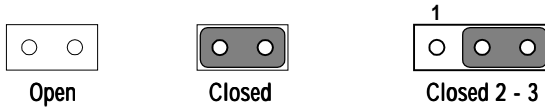
You may find a pair of needle-nose pliers useful for setting the jumpers.

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.

1.8.1 CPU clock ratio selection (JP12)

In order for the system to function properly, the jumpers must be set to accommodate the CPU installed on the CPU card. These jumpers set the frequency ratio between the internal frequency of the CPU and the external frequency (called the bus clock) within the CPU. Such jumpers must be set together with the jumpers for the CPU external (bus) frequency selection.

Table 1-3: CPU clock ratio selection (JP12)

1 ○ ○ 2 3 ○ ○ 4 5 ○ ○ 6 1.5x	1 ● ● 2 3 ○ ○ 4 5 ○ ○ 6 2x	1 ● ● 2 3 ● ● 4 5 ○ ○ 6 2.5x
1 ○ ○ 2 3 ● ● 4 5 ○ ○ 6 3x	1 ○ ○ 2 3 ○ ○ 4 5 ○ ○ 6 3.5x	1 ● ● 2 3 ○ ○ 4 5 ● ● 6 4x
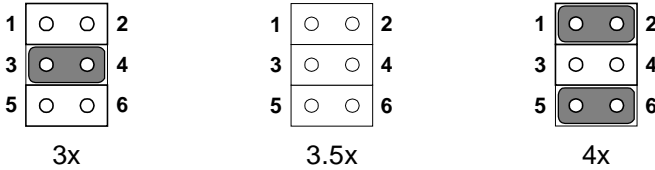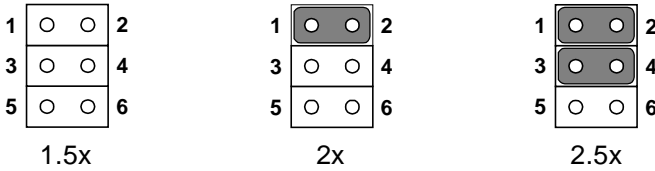
1.8.2 CPU external (bus) frequency selection (JP3)
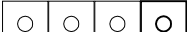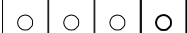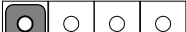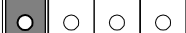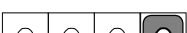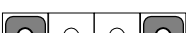
These jumpers tell the clock generator what frequency to send to the CPU. These allow the selection of the CPU's external frequency (or bus clock). The CPU's external frequency multiplied by the CPU clock ratio equals the CPU's internal frequency (i.e. the advertised CPU speed).

Table 1-4: CPU external (bus) frequency selection (JP3)

1 ● ● 2 3 ● ● 4 55 MHz	1 ● ● 2 3 ○ ○ 4 60 MHz	1 ○ ○ 2 3 ○ ○ 4 66 MHz	1 ○ ○ 2 3 ● ● 4 75 MHz
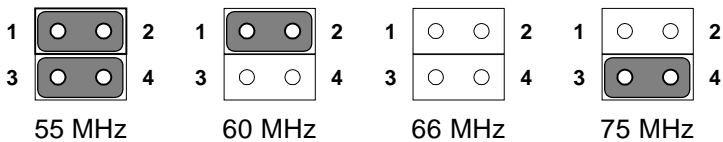
1.8.3 CPU core voltage select (JP4)

Table 1-5: CPU voltage select (JP4)

Voltage	JP4	Voltage	JP4
2.0 V		2.1 V	
2.2 V		2.3 V	
2.4 V		2.5 V	
2.6 V		2.7 V	
2.8 V		2.9 V	
3.0 V		3.1 V	
3.2 V		*3.3 V	
3.4 V		3.5 V	

* default setting

Note: *Please refer to the voltage that is shown on the processor chip.*

CPU Model	Freq.	Ratio	Bus Freq.	Bus Freq. (JP3)		Freq. Ratio (JP12)		
	MHz		MHz	1 - 2	3 - 4	1 - 2	3 - 4	5 - 6
Intel Pentium	233	3.5x	66	O	O	O	O	O
Intel Pentium	200	3.0x	66	O	O	O	S	O
Intel Pentium	166	2.5x	66	O	O	S	S	O
Intel Pentium	150	2.5x	60	S	O	S	S	O
Intel Pentium	133	2.0x	66	O	O	S	O	O
Intel Pentium	120	2.0x	60	S	O	S	O	O
Intel Pentium	100	1.5x	66	O	O	O	O	O
Intel Pentium	90	1.5x	60	S	O	O	O	O
Intel Pentium	75	1.5x	55	S	S	O	O	O
AMD-K6-PR233	233	3.5x	66	O	O	O	O	O
AMD-K6-PR200	200	3.0x	66	O	O	O	S	O
AMD-K6-PR166	166	2.5x	66	O	O	S	S	O
AMD-K5-PR133	100	1.5x	66	O	O	O	O	O
AMD-K5-PR120	90	1.5x	60	S	O	O	O	O
AMD-K5-PR100	100	1.5x	66	O	O	O	O	O
AMD-K5-PR90	90	1.5x	60	S	O	O	O	O
AMD-K5-PR75	75	1.5x	55	S	S	O	O	O
IBM/Cyrix 6x86 MX-PR233	180	2.5x	75	O	S	S	S	O
IBM/Cyrix 6x86 MX-PR200	150	2.0x	75	O	S	S	O	O
IBM/Cyrix 6x86 MX-PR166	133	2.0x	66	O	O	S	O	O
IBM/Cyrix PR166+	133	2.0x	66	O	O	S	O	O

O = open   S = short

Table 1-6: Setting jumpers according to internal speed of CPU

1.8.4 Watchdog timer configuration (JP7)

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.)

1.8.5 Watchdog timer action (JP7)

When the watchdog timer activates (CPU processing has come to a halt), it can reset the system or generate an interrupt on IRQ11. This can be set via setting JP7 as shown below:

Table 1-7: Watchdog timer system reset/IRQ 11 select (JP7)

	*System Reset	**IRQ 11**
JP7	1　2　3	1　2　3

* default setting

1.8.6 COM2 settings for RS-232/422/485 (JP6)
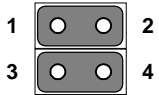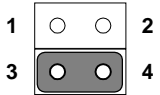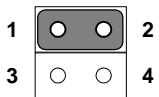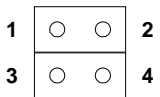
Table 1-8: COM2 settings for RS-232/422/485 (JP6)

Pins closed	*RS-232	RS-422	RS-485
1 - 2	open	open	short
3 - 4	open	short	open
5 - 6	short	open	open

* default setting

1.8.7 DOC® 2000 address setting (JP5)

Table 1-9: DOC2000 address setting (JP5)

Address	JP5	Address	JP5
*disable	1 ● ● 2 3 ● ● 4	D000	1 ○ ○ 2 3 ● ● 4
D800	1 ● ● 2 3 ○ ○ 4	E000	1 ○ ○ 2 3 ○ ○ 4

* default setting

1.8.8 CMOS clear selection (JP15)

Warning: To avoid damaging the computer, always turn off the power supply before setting "Clear CMOS".
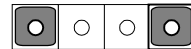
Table 1-10: CMOS clear selection (JP15)

	*Normal	**CMOS data clear**
JP15	○ ○ 1　2	● ● 1　2

* default setting

1.8.9 External speaker and internal buzzer (CN3)

Table 1-11: External speaker and internal buzzer (CN3)

	External speaker	***Internal buzzer**
CN3	● ○ ○ ●	○ ○ ● ●

* default setting

1.9 Installing DRAM (SIMMs and DIMMs)

You can install from 2 to 256 MB of any brand DRAM into your
PCA-6155V. The card provides two 72-pin SIMM (Single In-line
Memory Module) and two 168-pin DIMM (Dual In-line Memory
Module) sockets. Each socket accepts 1, 4, 8, 16, 32 or 64 MB SIMMs,
or 8 to 128 MB DIMMs. DIMMs can be used when the SIMM sockets
are not used. Two sockets are available for 3.3 volt (power level)
unbuffered synchronous DRAM (SDRAM) DIMMs or EDO DRAM
DIMMs.

1.9.1 Installing SIMMs

Note:　　*The modules can only fit into a socket one way. 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. Install the SIMM card. Install the SIMM so that its gold pins point
   down into the SIMM socket.

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

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

5. Check to ensure that the SIMM is correctly seated and all connec-
   tor contacts touch. The SIMM should not move around in its
   socket.

1.9.2 Installing DIMMs

The procedure for installing DIMMs appears below. Please follow these steps carefully. The number of pins are different on either side of the breaks, so the module can only fit in one way. DRAM SIMM modules have the same pin contact on both sides. SDRAM DIMM modules have different pin contacts on each side, and therefore have a higher pin density.

1. Make sure the two handles of the DIMM socket are in the "open" position. i.e. The handles remain leaning outward.

2. Slowly slide the DIMM module along the plastic guides on both ends of the socket.

3. 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.

To take out a memory module, just push both handles outward, and the module will be ejected by the mechanism in the socket.

> *Note: We do not recomend the use of both SIMMs and DIMMs at the same time, due to their different voltages. This may result in unstable system operation.*

Connecting Peripherals

This chapter explains how to connect peripherals, switches and indicators to the PCA-6155V board. You can access most of the connectors from the top of the board while it is installed in the chassis. If you have a number of cards installed, or your chassis is very tight, you may need to partially remove the card to make all the connections.

The following table lists the connectors on the PCA-6155V.

Table 2-1: PCA-6155V connectors

Number	Function
CON 1/ CON 2	Enhanced IDE ports
CN1	Floppy disk connector
CN2	Parallel port
CN3	Speaker connector
CN4	Power LED and keyboard lock
CN5	IR port
CN6	USB connector
CN7	VGA connector
CN9	COM2 RS-422/485 port
CN10	External keyboard
CN11	COM2 RS-232 port
CN13	COM1 RS-232 port
CN14	PC/104 A, B, C, D
CN15	Fan power
CN16	PS/2 mouse and keyboard

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

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

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

2.1 Enhanced IDE Connectors (CON 1, CON 2)

You can attach four IDE (Integrated Device Electronics) drives to the PCA-6155V's internal controller. The PCA-6155V CPU card has two EIDE connectors.

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

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

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

Connect the second drive as described above.

Note: *We do not recommend connecting to a Seagate ST-31010A, ST-31011A, ST-1277A, ST-31720A, ST-31721A, ST-32120A, ST-32121A, ST-32531A, 33230A, ST-33240A, ST-34340A, or ST-3852A IDE HDD. This is an incompatibility issue and not a fault of either device.*

2.2 Floppy Drive Connector (CN1)

You can attach up to two floppy disk drives to the PCA-6155V's on-board controller. You can use any combination of 5.25" (360 KB/1.2 MB) and/or 3.5" (720 KB/1.44/2.88 MB) drives.

The card comes with a 34-pin daisy-chain drive connector cable. 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 3.5" drives) and a printed-circuit-board connector (usually used for 5.25" drives). You can use only one connector in each set. The set on the end (after the twist in the cable) connects to the A: floppy. The set in the middle connects to the B: floppy.

2.3 Parallel Port Connector (CN2)

The parallel port is normally used to connect the CPU card to a printer. The PCA-6155V includes an on-board parallel port, accessed through a 26-pin flat-cable connector, CN2. The card comes with an adapter cable which lets you use a traditional DB-25 connector. The cable has a 26-pin connector on one end and a DB-25 connector on the other, mounted on a retaining bracket. The bracket installs at the end of an empty slot in your chassis, giving you access to the connector.

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

To install the bracket, find an empty slot in your chassis. Unscrew the plate that covers the end of the slot. Screw in the bracket in place of the plate. Next, attach the flat-cable connector to CN2 on the CPU card. Wire 1 of the cable is red or blue, and the other wires are gray. Make sure that wire 1 corresponds to pin 1 of CN2. Pin 1 is on the right side of CN2.

2.4 IR Connector (CN5)

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

2.5 USB Connector (CN6)

The PCA-6155V board 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 are fuse protected.

The USB interfaces are accessed through a 10-pin flat-cable connector, CN6. The adapter cable has a 10-pin connector on one end and a USB connector on the bracket.

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

2.6 VGA Display Connector (CN7)

The PCA-6155V provides a VGA controller for a high resolution VGA interface. The PCA-6155V's CN7 is a DB-15 connector for VGA monitor input. Pin assignments for the CRT display are detailed in Appendix C. Share memory architecture supports 0.5 MB, 1 MB, 1.5 MB, 2 MB, 2.5 MB, 3 MB, 3.5 MB and 4 MB system memory. The memory is configured in the system BIOS setup.

2.7 Keyboard & PS/2 Mouse Connector (CN16)

The PCA-6155V board provides a keyboard connector. A 6-pin mini-DIN connector (CN16) on the card mounting bracket supports single-board computer applications. The card comes with an adapter to convert from the 6-pin mini-DIN connector to a standard DIN connector and to a PS/2 mouse connector.

2.8   Front Panel Connectors (CN3 and CN4; JP1, JP2)

Next, you may want to install external switches to monitor and control the PCA-6155V. These features are optional - install them only if you need them. The front panel connector (CN3) is a 4-pin male; CN4 is a 5-pin male in-line header and provides connections for a speaker, hard disk access indicator, power on indicator, turbo indicator and an input switch for resetting the card.

Speaker/Buzzer Interface (CN3)
Contains an external speaker and an internal buzzer.

LED interface (CN4)
The front panel LED indicator for "power on" is an active high signal. If CN4 is connected to the keyholder, it can support keyboard lock function.

Reset switch (JP2)
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.

2.9   Serial Ports (CN13: COM1; CN11: COM2 / RS-232; CN9: COM2 / RS-422/485)

The PCA-6155V offers two serial ports: COM1 in RS-232, COM2 in RS-232/422/485. These ports let you connect to serial devices (a mouse, printers, etc.) or a communication network.

You can select the address for each port (For example,3F8H [COM1], 2F8H [COM2]) or disable it, using the BIOS Advanced Setup program, covered in Chapter 4.

The card mounting bracket holds the serial port connector for the one port, and the parallel port and serial port adapter kit (supplied with the card) holds the connector for the other port. This lets you connect and disconnect cables after you install the card. The DB-9 connector on the bottom of the bracket is the first RS-232 port, COM1. The two-box header 10-pin connector on the adapter kit is the second serial port, COM2.

Table 2-2: Serial port connections (COM1, COM2)

Connector	Function
COM1	RS-232
COM2	RS-232/422/485

2.9.1 RS-232 connection (COM1-CN13)

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

2.9.2 RS-232/422/485 connection (COM2-CN11, CN9)

COM2 is an RS-232/422/485 serial port. The specific port type is determined by jumper settings. See JP6 in Chapter 1 Subsecton 1.8.5.

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 PCA-6155V board's ports:

Table 2-3: PCA-6155V serial port default settings

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

Award BIOS Setup

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

3.1 AWARD BIOS Setup

```
                              ROM PCI/IS
                                CMOS SE
                               AWARD SC
  ┌──────────────────────────────────────────
  │    STANDARD CMOS SETUP
  │
  │    BIOS FEATURES SETUP
  │
  │    CHIPSET FEATURES SETUP
  │
  │    POWER MANAGEMENT SETUP
  │
  │    PNP/PCI CONFIGURATION
  │
  │    LOAD BIOS DEFAULTS
  │
  │    LOAD SETUP DEFAULTS
  ├──────────────────────────────────────────
  │ Esc : Quit
  │ F10 : Save & Exit Setup
  │
  │
```

Figure 3-1: 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 RAM so that it retains the Setup information when the power is turned off.

3.1.1 Entering setup

Turning on the computer and pressing <DEL> immediately will allow you to enter Setup.

3.1.2 Standard CMOS setup

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

```
                    ROM  PCI/ISA  BIOS  (2A5IIAKB)
                        CMOS  SETUP  UTILITY
                      AWARD  SOFTWARE,  INC.

    Date (mm:dd:yy) : Mon, Jul  3 199
    Time (hh:mm:ss) :  5 : 47 : 14

    HARD DISKS          TYPE    SIZE
    ─────────────────────────────────
    Primary Master   : Auto        0
    Primary Slave    : None        0
    Secondary Master : None        0
    Secondary Slave  : None        0

    Drive A : 1.44M, 3.5 in.
    Drive B : None

    Video   : EGA/VGA
    Halt On : All Errors


  ESC : Quit              ↑ ↓ → ←   :
  F1  : Help              (Shift)F2 :
```

Figure 3-2: CMOS setup screen

3.1.3 BIOS features setup

The "BIOS FEATURES SETUP" screen appears when choosing the BIOS FEATURES SETUP item from the CMOS SETUP UTILITY Menu. It allows the user to configure the PCA-6155V according to his particular requirements.

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

```
                        ROM PCI/IS
                          BIOS FEA
                          AWARD SC

Virus Warning                : Disable
CPU Internal Cache           : Enabled
External Cache               : Enabled
Quick Power On Self Test     : Enabled
Boot Sequence                : A,C,SCS
Swap Floppy Drive            : D
Boot Up Floppy Seek          : Enabled
Boot Up NumLock Status       : On
Boot Up System Speed         : High
Gate A20 Option              : Fast
Memory Parity Check          : Disable
Typematic Rate Setting       : Disable
Typematic Rate (Chars/Sec)   : 6
Typematic Delay (Msec)       : 250
Security Option              : Setup
PCI/VGA Palette Snoop        : Disable
OS Select For DRAM > 64MB    : Non-OS2
```

Figure 3-3: BIOS features setup screen

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

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

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

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

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

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

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

Enabled	BIOS searches the floppy drive to determine if it is 40 or 80 tracks. Note that BIOS cannot differentiate 720 KB, 1.2 MB, and 1.44 MB type drives as they are all 80 tracks.
Disabled	BIOS will not search for the floppy drive type by track number. Note that there will not be any warning message if the drive installed is 360 KB.

Boot Up NumLock Status
The default is "On".

On	Keypad boots up to number keys.
Off	Keypad boots up to arrow keys.

Boot Up System Speed

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

IDE HDD Block Mode

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

Gate A20 option

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

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

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

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

Security Option

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

System	The system will not boot, and access to Setup will be denied if the correct password is not entered at the prompt.
Setup	The system will boot, but access to Setup will be denied if the correct password is not entered at the prompt.

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

OS Select for DRAM >64 MB

This setting is under OS/2 system.

Video BIOS Shadow

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

C8000 - CFFFF Shadow/DC000-DFFFF Shadow

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

Enabled	Optional shadow is enabled
Disabled	Optional shadow is disabled

3.1.4 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
PCA-6155V.

Figure 3-4: CHIPSET features setup screen

VGA Shared Memory Size
Share memory architecture can support 0.5 MB, 1MB, 1.5 MB, 2 MB,
3 MB, 3.5 MB and 4 MB of system memory.

3.1.5 Power management setup

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

```
                    ROM PCI/IS
                     POWER MAN
                      AWARD S(
 Power Management    : Disable
 PM Control by APM   : Yes
 Video Off Option    : Susp,Stby -> Of
 Video Off Method    : V/H SYNC+Blank
 Switch Function     : Break/Wake
 Doze Speed (div by): 2
 Stdby Speed(div by): 3
 MODEM Use IRQ       : 3
 Hot Key Power Off   : Disabled

        ** PM Timers **
 HDD Off After       : Disable
 Doze Mode           : Disable
 Standby Mode        : Disable
 Suspend Mode        : Disable

        ** PM Events **
 COM Ports Activity : Enabled
 LPT Ports Activity : Enabled
 HDD Ports Activity : Enabled
```

Figure 3-5: Power management setup screen

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

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

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

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

3.1.6 PCI configuration setup

```
                        ROM PCI/IS
                         PNP/PCI C
                          AWARD SC

Resources Controlled By  : Manual
Reset Configuration Data : Disabled

IRQ-3  assigned to : PCI/ISA PnP
IRQ-4  assigned to : PCI/ISA PnP
IRQ-5  assigned to : PCI/ISA PnP
IRQ-7  assigned to : PCI/ISA PnP
IRQ-9  assigned to : PCI/ISA PnP
IRQ-10 assigned to : PCI/ISA PnP
IRQ-11 assigned to : PCI/ISA PnP
IRQ-12 assigned to : PCI/ISA PnP
IRQ-14 assigned to : PCI/ISA PnP
IRQ-15 assigned to : PCI/ISA PnP
DMA-0  assigned to : PCI/ISA PnP
DMA-1  assigned to : PCI/ISA PnP
DMA-3  assigned to : PCI/ISA PnP
DMA-5  assigned to : PCI/ISA PnP
DMA-6  assigned to : PCI/ISA PnP
DMA-7  assigned to : PCI/ISA PnP
```

Figure 3-6: PCI configuration screen

3.1.7 Load BIOS defaults

"LOAD BIOS DEFAULTS" indicates the most appropriate values for
the system parameters for minimum performance. These default
values are loaded automatically if the stored record created by the
Setup program becomes corrupted (and therefore unusable).

3.1.8 Load setup defaults

"LOAD SETUP DEFAULTS" loads the values required by the system
for maximum performance.

3.1.9 Integrated Peripherals

```
                              ROM PCI/IS
                               INTEGRATE
                                AWARD SC

    Internal PCI/IDE       : Both
    IDE Primary Master PIO : Auto
    IDE Primary Slave  PIO : Auto
    IDE Secondary Master PIO: Auto
    IDE Secondary Slave  PIO: Auto
    Primary Master  UltraDMA: Auto
    Primary Slave   UltraDMA: Auto
    Secondary MasterUltraDMA: Auto
    Secondary Slave UltraDMA: Auto
    IDE Burst Mode         : Enabled
    IDE Data Port Post Write: Enabled
    IDE HDD Block Mode      : Enabled

    Onboard FDC Controller  : Enabled
    Onboard Serial Port 1   : 3F8/IRQ4
    Onboard Serial Port 2   : 2F8/IRQ3
    IR Address Select       : Disable
```

Figure 3-7: Integrated peripherals

Note: *If you enable the IDE HDD block mode, the en-*
             hanced IDE driver will be enabled.

3.1.10 Password setting

To change, confirm, or disable the password, choose the "PASS-WORD SETTING" option from the Setup main menu and press [Enter]. The password can be at most 8 characters long.

Remember, to enable this feature. You must first select the Security Option in the BIOS FEATURES SETUP to be either "Setup" or "System." Pressing [Enter] again without typing any characters can disable the password setting function.

3.1.11 IDE HDD auto detection

"IDE HDD AUTO DETECTION" automatically self-detect for the correct hard disk type.

3.1.12 Save & exit setup

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

3.1.13 Exit without saving

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

PCI SVGA Setup

The PCA-6155V features an on-board VGA interface. This chapter provides instructions for installing and operating the software drivers on the included display driver diskette.

4.1 Introduction

The PCA-6155V's on-board VGA interface supports traditional analog CRT monitors. The VGA controller is built into the system's chip (SIS5598). It can support 1 to 4 MB of video memory share with the system memory. The interface can drive CRT displays with resolutions up to 1024 x 768 in 256 colors at 1 MB share memory, and up to 1280 x 1024 in 64 K colors at 4 MB share memory. The VGA interface is configured completely via the software utility, so you do not have to set any jumpers.

4.2 Before You Begin

To facilitate the installation of the enhanced display device drivers and utility software, you should read the instructions in this chapter carefully before you attempt installation. The enhanced display drivers for the PCA-6155V board are located on the software installation diskette. You must install the drivers and utility software by using the supplied SETUP program for DOS drivers.

Note: The files on the software installation diskette are compressed. Do not attempt to install the drivers by copying the files manually. You must use the supplied SETUP program to install the drivers.

Before you begin, it is important to note that most display drivers need to have the relevant software application already installed in the system prior to installing the enhanced display drivers. In addition, many of the installation procedures assume that you are familiar with both the relevant software applications and operating system commands. Review the relevant operating system commands and the pertinent sections of your application software's user's manual before performing the installation.

4.3　Utility Disk

The PCA-6155V is supplied with software utility disks that hold the necessary files for setting up the VGA display and Ethernet and Windows controller. The disks are labeled as follows:

Disk 1:　VGA utility for Windows NT

Disk 2:　VGA utility for Windows 3.1 English version

Disk 3:　VGA utility for OS2 3.0 #1

Disk 4:　VGA utility for OS2 3.0 #2

Disk 5:　IDE driver

Disk 6:　VGA utility for Windows 95

Disk 7:　VGA utility for Windows 3.1 Chinese version

Total:　7 disks

4.4　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.

4.4.1 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:\setup**. 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 *SETUP.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.

4.4.2 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:** <EN-TER> 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 <ENTER>.

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 Windows 3.1.

4.5 Windows 95 Drivers Setup Procedure

1. Boot system with VGA or SuperVGA driver.

2. Select properties from a menu after right button press.

3. Select Display.

4. Select Change Display.

5. Select Change Monitor.

6. Select Change Adapter.

7. Select Have Disk.

4.6   Windows NT Drivers Setup Procedure

Step 1

1. Install Windows NT as you normally would for a VGA display.

2. First click the Start button, choose Settings and click on the Control Panel.

3. Choose the Display icon and click on the icon.

4. In the Display Properties window, click on the Settings tab.

5. Click on Change Display Type. In the Change Display Type window, click on the Change button under Adapter Type. This will bring up the Select Device window.

Step 2

1. In the Select Device window, click on the Other button. Enter source directory where the Windows NT driver files are located.

2. Press <ENTER> and the name of the Chips and Technologies Video Accelerator driver will appear at the end of Models list box. Scroll to the end of the list box and double click on the driver.

3. Once the installation is complete, the system must be shut down and restarted.

Step 3

1. Upon restarting your computer, select the desired display settings from the Display Property dialog box.

2. Click on Test to test the newly selected graphics mode. A color test screen should appear, followed by the Testing Mode window.

3. Click on Yes to continue. The Display Settings Change window will appear.

4. Click on Restart Now for the new settings to take effect.

4.7 OS/2 Drivers Setup Procedure

Preliminary steps

The following steps must be performed before you install the SIS5598 display driver:

1. OS/2 DOS Support must be installed.

2. If you previously installed SVGA support, you must reset the system to VGA mode. VGA is the default video mode enabled when OS/2 is installed.

To restoreVGA mode, use Selective Install and select VGA for Primary Display. For more information on this procedure, see the section on Changing Display Adapter Support in the OS/2 User's Guide.

Installing from diskette

To install this driver:

1. Open an OS/2 full screen or windowed session.

2. Place the SIS5598 Display Driver diskette in Drive A.

3. At the OS/2 command prompt, type the following commands to copy the files to the OS/2 drive:

```
A:      <ENTER> to make this the default drive.

SETUP A:    C:    <ENTER>
```

where   A: is the floppy disk drive, and

C: is the hard disk partition containing \OS2

When the setup program is completed, you will need to perform a shutdown 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:

   a) Open the OS/2 System folder.

   b) Open the System Setup folder.

   c) Open the Display Driver Install Object.

   Steps a), b) and c) will execute the Display Driver Installation (DSPINSTL) utility program to finish installation of the new drivers.

   d) When the Display Driver Install window appears, select Primary Display and then select OK.

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

When the system has restarted, the display driver will be initialized for 640 x 480 x 256 color, 60 Hz refresh. To switch to a different video resolution color depth or a different refresh rate, see the following sections:

Selecting monitor type

Monitor type is initially set to DEFAULT. This DEFAULT setting may not allow you to select all resolution/refresh combinations that are available for your monitor. The following steps can be done to select monitor type. This section applies only after installation, or when a different monitor is used.

1. Open the OS/2 System folder.

2. Open the System Setup folder.

3. Open the System object.

4. When the System-Settings notebook appears, select the Screen tab. This will take you to page 2 of the settings.

5. On Screen page 2, select your monitor type from the Display Name list. If your monitor is not listed, select DEFAULT.

It may be necessary to restart your system to have all refresh rate options available.

Selecting screen resolution / refresh rate

To switch t a different video resolution, color depth or refresh rate:

1. Open the OS/2 System folder.

2. Open the System Setup folder.

3. Open the System object.

4. From the selection windows provided, select a new screen resolution and screen refresh rate.

   Note that refresh rates other than 60 Hz are only valid when the display is switched to CRT Only display mode.

5. Close the System-Settings notebook.

6. Perform the shutdown and restart for the changes to take effect.

Installation notes

1. During the installation of this driver, DISPLAY.LOG and DSPINSTL.LOG files are created in the \OS2\INSTALL directory. These files identify the OS/2 system files that were updated, and indicate whether the installation was successful. the DISPLAY.LOG file also contains a string that identifies the version of driver that was installed. This information may be important when reporting an installation problem.

2. During installation, DSPINSTL will invoke the SVGA Configuration program SVGA.EXE to determine the hardware configuration, and create the file \OS2\INSTALL\SVGADATA.PMI. If this file is not created, the adapter will not be supported. When this step is done, the display will be blanked out. You may see a series of flashes on the display and/or what appears to be a "corrupted" display. This is normal, as the configuration process is performing Video BIOS mode sets to determine which screen resolutions BIOS supports. This configuration information is then used to provide the Systems-Settings Resolution and Refresh selections.

A

Programming the Watchdog Timer

The PCA-6155V is equipped with a watchdog timer that resets the CPU or generates an interrupt if processing comes to a standstill for any reason. This feature ensures system reliability in industrial standalone or unmanned environments.

Programming the Watchdog Timer

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

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

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

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

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

1000    REM  Subroutine #1, your application task
•       •
•       •
•       •
1070    RETURN
2000    REM  Subroutine #2, your application task
•       •
•       •
•       •
2090    RETURN
```

Installing PC/104 Modules

This appendix gives instructions for installing PC/104 modules.

B.1 Installing PC/104 modules

The PCA-6155V's PC/104 connectors give you the flexibility to attach PC/104 modules.

Installing these modules on the PCA-6155V is quick and simple. The following steps show how to mount the PC/104 modules:

1. Remove the PCA-6155V 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. (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 screws.

PC/104
Mounting Support
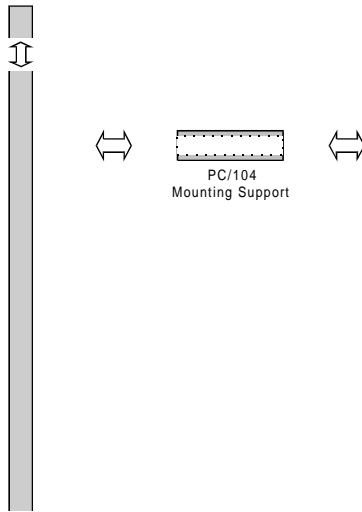
Figure B-1: PC/104 module mounting diagram

8.9   82.5

95.9
90.8   φ6.4

φ3.2

Unit: mm (±0.1)

5.1

0

0   5.1   85.1   90.2
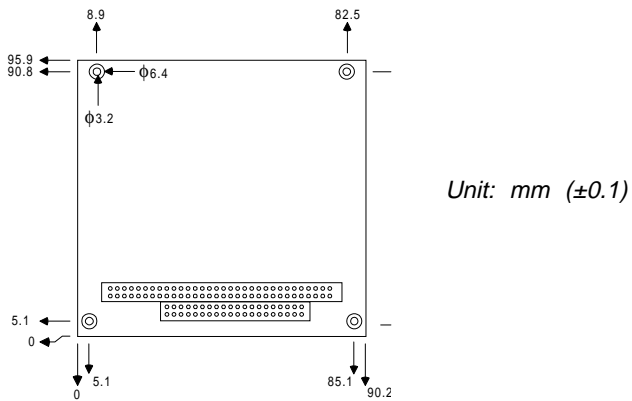
Figure B-2: PC/104 module dimensions

Table B-1: PCA-6155V PC/104 connectors (CN14)

Pin Number	Signal Row A	Row B	Signal Row C	Row D
1	IOCHCHK*	0 V	SBHE*	MEMCS16*
2	SD7	RESETDRV	LA23	IOCS16*
3	SD6	+5 V	LA22	IRQ10
4	SD5	IRQ9	LA21	IRQ11
5	SD4	-5 V	LA20	IRQ12
6	SD3	DRQ2	LA19	IRQ15
7	SD2	-12 V	LA18	IRQ14
8	SD1	ENDXFR*	LA17	DACK0*
9	SD0	+12 V	MEMR*	DRQ0
10	IOCHRDY	N/C	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	+5 V
17	SA14	DACK1*	SD14	MASTER*
18	SA13	DRQ1	SD15	0 V
19	SA12	REFRESH*	KEY	0 V
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	+5 V	—	—
30	SA1	OSC	—	—
31	SA0	0 V	—	—
32	0 V	0 V	—	—

*active low

Pin Assignments

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

• CRT display connector

• RS-232/422/485 serial port connector

• Keyboard and mouse connector

• External keyboard connector

• IDE connector

• USB connector

• CPU fan power connector

• Floppy connector

• Parallel connector

• IR connector

• HDD LED connector

C.1 CRT Display Connector (CN7)

Table C-1: PCA-6155V CRT display connector

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

C.2 COM2 RS-232/422/485 Serial Port (CN9, CN11)
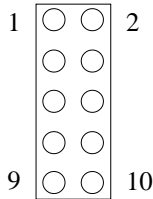
Table C-2: PCA-6155V COM2 RS-232/422/485 series port

	CN11	CN9	CN9
Pin	RS-232 port	RS-422 port	RS-485 port
1	DCD	TXD-	DATA-
2	DSR	N/C	N/C
3	RxD	TXD+	DATA+
4	RTS	N/C	N/C
5	TxD	RXD+	N/C
6	CTS	N/C	N/C
7	DTR	RXD-	N/C
8	RI	N/C	N/C
9	GND	GND	GND
10	N/C	N/C	N/C

C.3 External Keyboard Connector (CN10)

Table C-3: PCA-6155V external keyboard connector

Pin	Signal
1	CLK
2	DATA
3	NC
4	GND
5	V_{CC}

C.4 COM1 RS-232 Serial Port (CN13)

```
5  ○ ○  9
4  ○ ○  8
3  ○ ○  7
2  ○ ○  6
1  ○ ○
```
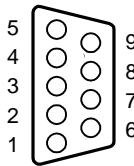
Table C-4: PCA-6155V COM1 RS-232 serial port

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

C.5 Keyboard and Mouse Connnector (CN16)

Table C-5: PCA-6155V keyboard and mouse connector

Pin	Signal
1	KB DATA
2	MS DATA
3	GND
4	V_{CC}
5	KB CLOCK
6	MS CLOCK

C.6 IDE Hard Drive Connector (CON1, CON2)

```
39 37  ....   3  1
○  ○        ○  ○
        • • •
○  ○        ○  ○
40 38  ....   4  2
```
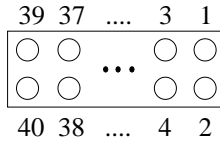
Table C-6: PCA-6155V IDE hard drive connector

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
21	IDE DRQA/B	22	GND
23	IO WRITE	24	GND
25	IO READ	26	GND
27	IO CHANNEL READY	28	N/C
29	HDACKO*	30	GND
31	IRQ14 / IRQ15*	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	GND

* Low active

C.7 USB Connector (CN6)

```
1  ◯ ◯  2
   ◯ ◯
   ◯ ◯
   ◯ ◯
9  ◯ ◯  10
```
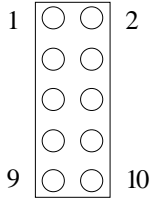
Table C-7: USB1/USB2 connector

Pin	USB1 Signal	Pin	USB2 Signal
1	+5 V	2	+5 V
3	UV-	4	UV-
5	UV+	6	UV+
7	GND	8	GND
9	Chassis GND	10	N/C

C.8 CPU Fan Power Connector (CN15)

```
◯  1
◯  2
◯  3
```
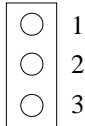
Table C-8: PCA-6155V CPU fan power connector

Pin	Signal
1	NC
2	GND
3	+12 V

C.9 Floppy Drive Connector (CN1)

```
33  31  ....  3   1
○   ○         ○   ○
         ...
○   ○         ○   ○
34  32  ....  4   2
```
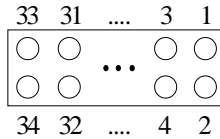
Table C-9: PCA-6155V floppy drive connector

Pin	Signal	Pin	Signal
1	GND	2	DENSITY SELECT*
3	GND	4	N/C
5	GND	6	N/C
7	GND	8	INDEX*
9	GND	10	MOTOR 0*
11	GND	12	DRIVE SELECT 1*
13	GND	14	DRIVE SELECT 0*
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*

* Low active

C.10 Parallel Port Connector (CN2)

```
25  23  ....   3   1
○   ○        ○   ○
        • • •
○   ○        ○   ○
26  24  ....   4   2
```
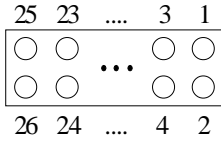
Table C-10: PCA-6155V parallel port connector

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

C.11 IR Connector (CN5)

Table C-11: PCA-6155V IR connector

Pin	Signal
1	+5 V
2	N/C
3	IR_RX
4	GND
5	IR_TX

C.12 HDD LED Connector (JP1)

Table C-12: PCA-6155V HDD LED connector

Pin	Signal
1	V_{CC}
2	LED

C.13 System I/O Ports

Table C-13: System I/O ports

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

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

C.14 DMA Channel Assignments

Table C-14: DMA channel assignments

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

* Audio DMA select 0, 1 or 3

C.15 Interrupt Assignments

Table C-15: Interrupt assignments

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

* PNP audio IRQ select: 5, 7, 9, 10, 11 or 12

C.16 1st MB Memory Map

Table C-16: 1st MB memory map

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

APPENDIX

D

DOC® 2000 Installation Guide

This appendix contains information on the DiskOnChip® 2000 quick installation guide. It includes:

- DiskOnChip® 2000 installation instructions

- Additional information and assistance

DiskOnChip® 2000 Quick Installation Guide

DiskOnChip® 2000 installation instructions

1. Make sure the target platform is powered OFF.

2. Plug the DiskOnChip® 2000 device into its socket. Verify the direction is correct (pin 1 of the DiskOnChip® 2000 is aligned with pin 1 of the socket).

3. Power up the system.

4. During power up you may observe the messages displayed by the DiskOnChip® 2000 when its drivers are automatically loaded into the system's memory.

5. At this stage the DiskOnChip® 2000 can be accessed as any disk in the system.

6. If the DiskOnChip® 2000 is the only disk in the system, it will appear as the first disk (drive C: in DOS).

7. If there are more disks besides the DiskOnChip 2000, the DiskOnChip® 2000 will appear by default as the last drive, unless it was programmed as the first drive. (Please refer to the DiskOnChip® 2000 utilities user manual.)

8. If you want the DiskOnChip® 2000 to be bootable:

   a . Copy the operating system files into the DiskOnChip® by using the standard DOS command (for example: sys d:).

   b . The DiskOnChip® should be the only disk in the systems or would be configured as the first disk in the system (c:) using the DUPDATE utility.

   ```
   DUPDATE D /S: DOC104.EXB /FIRST   (set as c:)
   DUPDATE C /S: DOC104.EXB          (set as d:)
   ```

Additional information and assistance

1. Visit M-Systems' Web site at www.m-sys.com where you can find Utilities Manual, Data Sheet and Application Notes. In addition, you can find the latest DiskOnChip® 2000 S/W Utilities.

2. Contact your dealer for technical support if you need additional assistance, and have the following information ready:

   - Product name and serial number

   - Description of your computer hardware (manufacturer, model, attached devices, etc.)

   - Description of your software (operating system, version, application software, etc.)

   - A complete description of the problem

   - The exact wording of any error messages