PCA-6144V

Half-size 486 CPU Card
with SVGA Controller

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Acknowledgements

A Message to the Customer....

Advantech Customer Services

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Your satisfaction is our number one concern. Here is a guide to Advantech's 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. If you run into technical difficulties, we are here to help. But please consult this manual first.

If you still can't 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 trained and ready to give you the support you need to get the most from your Advantech 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 Advantech 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.

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

1. Collect all the information about the problem encountered (e.g. type of PC, CPU speed, Advantech 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 other 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 completely filled-out Repair and Replacement Order Card and a photocopy of a dated proof of purchase (such as your sales receipt) in a shippable container. A product returned without dated proof of purchase 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 PCA-6144V CPU card

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

• 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

• 3 Utility disks with SVGA utility programs and drivers

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

Contents

Hardware Configuration

This chapter gives background information on the PCA-6144V. It then shows you how to configure the card to match your application and prepare it for installation into your PC.

Sections include:

- Card specifications
- Board layout
- Safety precautions
- Jumper settings
- Installing DRAM (SIMMs)

Introduction

The PCA-6144V is an all-in-one single board 486 computer that includes an **on-board SVGA controller**. It packs all the functions of an industrial computer, including display capabilities, on a single half-size card. The PCA-6144V is fully PC/AT compatible, so your software will run without modifications.

The on-board VL-bus SVGA controller uses the Trident TGUI 9440 chipset with 1 MB video memory. This chipset, used with the local bus, enables 32-bit graphic throughput at up to 33 MHz. The TGUI 9440 also offers Windows graphics acceleration. These features are excellent for display-intensive applications.

Another feature of the PCA-6144V is the inclusion of a fast VL bus enhanced IDE controller. This controller supports mode 4, which enables data transfer rates in excess of 16 MB/second. Up to two IDE devices can be connected, including large hard disks (up to 8 GB), CD-ROM drives, Tape backup drives or other enhanced IDE devices.

On-board features also include two high-speed serial ports with 16C550 UARTs, one bidirectional SPP/EPP/ECP parallel port and a floppy drive controller. In addition to the 486's 8 KB of on-chip cache memory, the PCA-6144V includes an extra 128 KB of second level cache memory on-board.

If program execution is halted by a program bug or EMI, the board's 63-level watchdog timer can automatically reset the CPU or generate an interrupt. This ensures reliability in unmanned or standalone systems. The timer interval of the watchdog timer is set by software, eliminating jumper switch setting.

The PCA-6144V provides two 72-pin SIMM (Single In-line Memory Module) sockets for its on-board system DRAM. These sockets give you the flexibility to configure your system from 1 MB to 64 MB of DRAM using the most economical combination of SIMMs.

Specifications

System

- **CPU**: 80486SX/DX/DX2/DX4-25/33/40/50/66/75/100/120 MHz, Cyrix 5x86-100/120 MHz, or AMD 5x86-133 MHz

- **2nd level cache**: 128 KB on board

- **Bus interface**: ISA

- **Chipset**: VIA VT82C496G

- **BIOS**: AWARD

- **Display controller**: SVGA, VL bus, Trident TGUI chipset with 1 MB standard video memory. Provides 32-bit graphic throughput with Windows acceleration. Supports resolutions up to 1280 x 1024 in 16 colors, 800 x 600 in 65536 colors, or 640 x 480 in 16.8 million colors.

- **Processing ability**: 32 bit

- **Bus speed**: 8 MHz (ISA)

- **RAM memory**: 1 MB to 64 MB. Uses two 72-pin SIMM sockets. 72-pin sockets accept 1, 2, 4, 8, 16 or 32 MB SIMMs

- **Shadow RAM memory**: Supports system and video BIOS of up to 256 KB in 16 KB blocks

I/O

- **Enhanced IDE hard disk drive interface**:
  Fast VL bus. Supports up to two IDE (AT bus) large (up to 8 GB) hard disk drives or other enhanced IDE devices. Supports mode 4 (16.6 MB/sec. data transfer rate). BIOS enabled/disabled

- **Floppy disk drive interface**: Supports up to two floppy disk drives, 5.25" (360 KB and 1.2 MB) and/or 3.5" (720 KB, 1.44 MB and 2.88 MB). BIOS enabled/disabled

- **Enhanced bidirectional parallel port**: Configurable to LPT1, LPT2, LPT3, or disabled. Standard DB-25 female connector provided. Supports SPP/EPP/ECP

- **Serial ports**: Two serial ports, both with 16C550 UARTs (or compatible) with 16-byte FIFO buffer. COM1 is RS-232, COM2 is RS-232 or RS-485. Support speeds up to 115 Kbps. Ports can be individually configured as COM1, COM2 or disabled.

- **Keyboard & PS/2 mouse connector**: A 6-pin mini DIN keyboard connector is located on the mounting bracket for easy connection of a keyboard or a PS/2 mouse.

- **Watchdog timer:** Can generate a system reset or IRQ15. The timer interval is 1 - 63 sec. (63 levels), set up by software.

General

- **System performance (with 80486DX4-100 MHz CPU)**: 363 MHz, Landmark speed V2.0

- **Max. power requirements**: +5 V, 3.5 A

- **Power supply voltage**: +5 V (4.75 V to 5.25 V)

- **Operating temperature**: 32 to 140ºF (0 to 60ºC)

- **Storage temperature:** -40 to +176°F (-40 to +80ºC)

- **Humidity:** 5 to 95%, non-condensing

- **Board size**: 7.3" (L) x 4.8" (W) (185 mm x 122 mm)

- **Board weight**: 1.2 lb. (0.5 kg)

Board layout
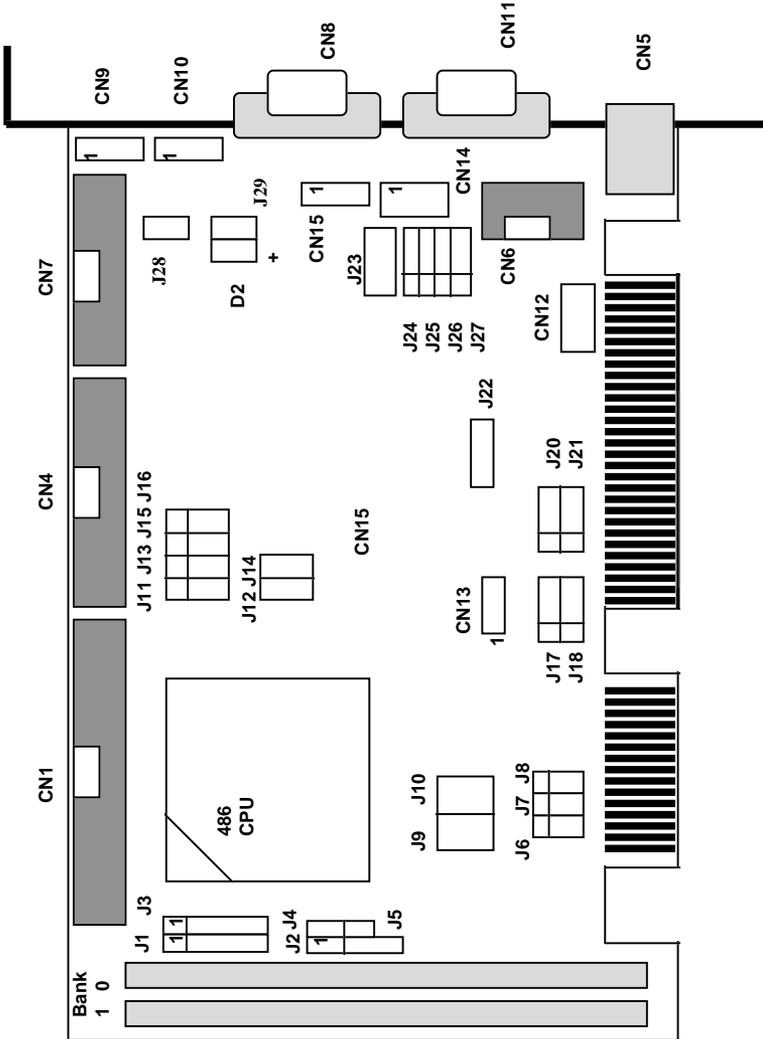
PCA-6144V PCB Layout

Jumpers and connectors

Connectors on the board link it to external devices such as hard disk drives, a keyboard, or floppy drives. In addition, the board has a number of jumpers which you use to configure it for your application.

The table below lists the function of each of the board 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.

PCA-6144V Jumpers

Number	Function
J1-J8	CPU type select
J9	CPU voltage select
J10	CPU voltage select
J11	CPU type select
J12	CPU type select
J13	CPU type select
J14	Factory reserved
J15	CPU type select
J16	CPU type select
J17	RTC erase On/Off
J18	Parallel port IRQ select
J20	Parallel port DMA select
J21	Parallel port DMA select
J22	Factory reserved
J23	COM2 select
J24	COM2 select
J25	COM2 select
J26	COM2 select
J27	COM2 select
J28	Watchdog timer reset/IRQ15 select
J29	Reset
D2	HDD LED

PCA-6144V Connectors	
Number	Function
CN1	EIDE connector
CN2	PC/104 connector (8 bit)
CN3	PC/104 connector (16 bit)
CN4	Floppy connector
CN5	Keyboard & PS/2 mouse DIN connector
CN6	COM2 pin-header connector
CN7	Parallel port connector
CN8	VGA DB-15 connector
CN9	Power connector (+5 V, +12 V)
CN10	Power connector (-5 V, -12 V)
CN11	COM1 DB-9 connector
CN13	External speaker connector
CN14	Keyboard pin-header connector
CN15	Power LED and keylock

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.

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.

How to set jumpers

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

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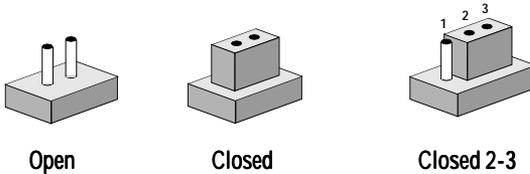
You may find pair of needle-nose pliers useful for setting the jumpers.

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.

CPU type select (J1 - J16)

In order for the system to function properly, the jumpers must be set to accommodate the CPU installed on the CPU card.

CPU type select (J1 - J16)

CPU \	J1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
AMD DX2-66 (5 V)																
AMD DX2-66 (3.3 V) AMD DX4-100 (Standard)																
AMD DX4-100 (Enhanced)																
AMD DX4-120																

CPU type select (J1 - J16), cont.

CPU \	J1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
AMD 5x86-133																
Cyrix DX2-66 (5 V)																
Cyrix DX2-80 (3.45 V)																
Cyrix DX4-100																

CPU type select (J1 - J16), cont.

CPU \	J1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Cyrix 5x86-100																
Cyrix 5x86-120																
Intel DX2-66																
Intel DX4-100 (3.3 V)																

RTC data erase On/Off (J17)

RTC data is either kept or erased, depending upon J17's setting status.

RTC data erase On/Off (J17)		
	On (keep data)	**Off (lose data)**
J17	1 2 3 ●●○	1 2 3 ○●●

Parallel port IRQ select (J18)

Parallel port IRQ select (J18)		
	IRQ5	**IRQ7 (default)**
J18	1 2 3 ○●●	1 2 3 ●●○

Parallel port ECP/EPP DMA channel (J20, J21)

You can set the DMA channel of the parallel port to either DMA 1 or DMA 3.

Parallel port ECP/EPP DMA channel (J20, J21)		
	DMA 1 (default)	**DMA 3**
J20	1 2 3 ●●○	1 2 3 ○●●
J21	●●○	○●●

Watchdog timer (J28)

Watchdog timer system reset/IRQ15 select (J28)

	Reset (default)	IRQ15
J28	● ● ○	○ ● ●

COM2 settings for RS-232/485 (J23-27)

COM2 settings for RS-232/485 (COM2)

	RS-232	RS-485
J23	1 2 3 ○ ○ ● ○ ○ ●	1 2 3 ● ○ ○ ● ○ ○
J24	○ ● ●	● ● ○
J25	○ ● ●	● ● ○
J26	○ ● ●	● ● ○
J27	○ ● ●	● ● ○

Installing DRAM (SIMMs)

On the left end of the card (away from the mounting bracket) are the two SIMM (Single In-line Memory Module) sockets that hold the card's DRAM memory. See the board layout diagram depicted earlier in this chapter.

You can use anywhere from 1 MB to 64 MB of DRAM with your PCA-6144V. The card provides two 72-pin SIMM (Single In-Line Memory Module) sockets that accept from 1 to 32 MB DRAM each. The sockets (numbered from 1 to 2) are arranged into two banks. The following table shows the bank assignments for the SIMM sockets:

Bank	SIMM socket(s)	Size
1	SIMM1	72-pin
2	SIMM2	72-pin

The PCA-6144V's memory sockets accept any combination of SIMMs (up to 64 MB), inserted in any order.

Connecting peripherals

This chapter tells how to connect peripherals, switches and indicators to the PCA-6144V 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-6144V. See Chapter 1 for help locating the connectors.

Connectors	
Label	**Component**
CN1	EIDE connector
CN2	PC/104 connector (8 bit)
CN3	PC/104 connector (16 bit)
CN4	Floppy connector
CN5	Keyboard & PS/2 mouse DIN connector
CN6	COM2 pin-header connector
CN7	Parallel port connector
CN8	VGA DB-15 connector
CN9	Power connector (+5 V, +12 V)
CN10	Power connector (-5 V, -12 V)
CN11	COM1 DB-9 connector
CN13	External speaker connector
CN14	Keyboard pin-header connector
CN15	Power LED and keylock
JP29	Reset
D2	HDD LED

The following sections tell how to make each connection. In most cases, you will simply need to connect a standard cable.

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 the sudden rush of power. Only experienced electronics personnel should open the PC chassis.

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

Enhanced IDE connectors (CN1)

You can attach two IDE (Integrated Device Electronics) drives to the PCA-6144V's internal controller. The PCA-6144V CPU card has an EIDE connector, CN1.

Wire number 1 on the cable is red or blue, the other wires are gray. Connect one end to connector CN1 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 on CN1.

Floppy drive connector (CN4)

You can attach up to two floppy disk drives to the PCA-6144V's on-board controller. You can use any combination of 5.25" (360 KB and 1.2 MB) and/or 3.5" (720 KB and 1.44 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.

Parallel port (CN7)

The parallel port is normally used to connect the CPU card to a printer. The PCA-6144V includes an on-board parallel port, accessed through a 26-pin flat-cable connector, CN7. The card comes with an adapter cable which lets you use a traditional DB-25 connector. The cable has a 26-pin connector on one end and a DB-25 connector on the other, mounted on a retaining bracket. The bracket installs at the end of an empty slot in your chassis, giving you access to the connector.

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

Keyboard & PS/2 mouse connectors (CN5)

The PCA-6144V board provides a keyboard connector. A 6-pin mini-DIN connector (CN5) 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.

Reset switch (J29)

You can connect an external switch to easily reset your computer. This switch restarts your computer as if you had turned off the power, then turned it back on. Install the switch so that it closes the two pins of J29.

Hard disk drive LED (D2)

You can connect a LED to connector D2 to indicate when the HDD is active. Marks on the circuit board indicate LED polarity.

VGA display connector (CN8)

The PCA-6144V provides a VGA controller for high resolution VGA interface. CN8 is a DB-15 connector for VGA monitor input.

Serial Ports

The PCA-6144V offers two serial ports: COM1 in RS-232, COM2 in RS-232/485. These ports let you connect to serial devices (a mouse, printers, etc.) or a communication network.

You can select the address for each port (3F8H [COM1], 2F8H [COM2] or 3E8H) or disable it, using the BIOS Advanced Setup program, covered in Chapter 3.

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 DB-9 connector on the adapter kit is the second serial port, COM2.

Serial port connections (CN6, CN11)

Connector	Address
CN6	COM2
CN11	COM1

RS-232 connection (COM1)

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. The following table shows the pin assignments for the card's RS-232 port:

RS-232 connector pin assignments

Pin	Signal	
1	DCD	
2	RX	
3	TX	
4	DTR	
5	GND	
6	DSR	
7	RTS	
8	CTS	
9	RI	
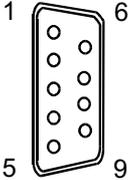
COM1

RS-232/485 connection (COM2)

COM2 is an RS-232/485 serial port. The specific port type is determined by jumper settings J23 - J27, as detailed in Chapter 1. The following table shows the pin assignments for COM2.

RS-232/485 connector pin assignments

Pin	RS-232	RS-485
1	DCD	DATA-
2	RX	DATA+
3	TX	-
4	DTR	-
5	GND	GND
6	DSR	-
7	RTS	-
8	CTS	-
9	RI	-
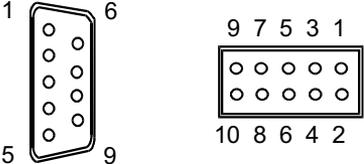
DB-9 COM2 adapter   CN6 pin-header

Power connectors (CN9, CN10)

If you prefer not to acquire power through PCA-6144V's back-plane via the gold H-connectors, CN9 and CN10 also provide power input connectors for +5 V, +12 V, -5 V, and -12 V.

Warning! **Before** making the connection, make sure the voltage is absolutely correct and matched with the right connector.
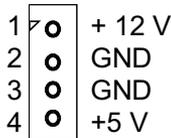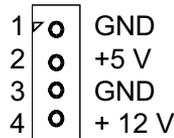
1	+ 12 V		1	GND
2	GND		2	+5 V
3	GND		3	GND
4	+5 V		4	+ 12 V
CN9			**CN10**	

External speaker connector (CN13)

The CPU card has its own buzzer. However, you can also connect to the external speaker on your computer chassis. Connect leads to connector CN13 as shown below:

External speaker connector (CN13)	
Pin	**Function**
1	Speaker out
2	NC
3	GND
4	+5 VDC

Keyboard pin-header connector (CN14)

The PCA-6144V has a pin-header connector to support passive backplane applications. Pin functions are as follows:

Keyboard pin-header connector (CN14)	
Pin	**Function**
1	KB clock
2	KB data
3	NC
4	GND
5	+5 VDC

Power LED and keylock (CN15)

You can connect an LED to indicate when the CPU card is on. Pin 1 of CN15 supplies power to the LED, and Pin 3 is the ground.

You can use a switch (or a lock) to disable the keyboard. In this state the PC will not respond to any input. This is useful if you do not want anyone to change or stop a running program. Simply connect the switch between Pins 4 and 5 of CN15. The pin assignments for CN15 are as listed below:

Power LED and keylock (CN15)	
Pin	**Function**
1	LED power (+5 V)
2	VCC
3	GND
4	Keyboard lock
5	GND

AWARD BIOS SETUP

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

AWARD BIOS Setup

```
            ROM PCI/ISA BIOS (2A4IBAK1)
                CMOS SETUP UTILITY
               AWARD SOFTWARE, INC.
```

ΣΤΑΝΔΑΡΔ ΧΜΟΣ ΣΕΤΥΠ	ΓΑΣΣΩΟΡΔ ΣΕΤΤΙΝΓ
ΒΙΟΣ ΦΕΑΤΥΡΕΣ ΣΕΤΥΠ	ΙΔΕ ΗΔΔ ΑΥΤΟ ΔΕΤΕΧΤΙΟΝ
ΧΗΙΓΣΕΤ ΦΕΑΤΥΡΕΣ ΣΕΤΥΠ	ΣΑϛΕ & ΕΞΙΤ ΣΕΤΥΠ
ΓΟΩΕΡ ΜΑΝΑΓΕΜΕΝΤ ΣΕΤΥΠ	ΕΞΙΤ ΩΙΤΗΟΥΤ ΣΑϛΙΝΓ
ΛΟΑΔ ΒΙΟΣ ΔΕΦΑΥΛΤΣ	
ΛΟΑΔ ΣΕΤΥΠ ΔΕΦΑΥΛΤΣ	

```
    ESC : Quit          ↑ ↓ ← →   : Select Item
    F1  : Help          (Shift)F2 : Change Color

            Time,  Date,  Hard Disk Type...
```

Setup program initial screen

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

Entering setup

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

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 (2A4IEAK1)
                  CMOS SETUP UTILITY
                 AWARD SOFTWARE, INC.

 Date (mm:dd:yy) : Mon, July 17, 1995
 Time (hh:mm:ss) : 17 : 13 : 24

 HARD DISK       TYPE  SIZE  CYLS HEAD PRECMP LANDZ SECTOR  MODE

 Primary Master : Auto  547  1060  16  65535  1059    63  Normal
 Primary Slave  : None    0     0   0      0     0     0   ------


 Drive A : 1.44M, 3.5 in.
 Drive B : 1.2M, 5.25 in.

 Video   : EGA/VGA                     Base Memory:    640K
 Halt On : All Errors               Extended Memory:  15360K
                                       Other Memory:    384K
                                      ─────────────────────────
                                       Total Memory:  16384K

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

CMOS setup screen

BIOS features setup

By choosing the "BIOS FEATURES SETUP" option from the INITIAL SETUP SCREEN Menu, the screen below is displayed. This sample screen contains the manufacturer's default values for the PCA-6144V.

```
                    ROM PCI/ISA BIOS (2A4IBAK1)

ςι ρυσ Ωαονι νγ        : Ενοβλεδ    ςι δεο ΒΙ ΟΣ Σηαδοω      : Ενοβλεδ
ΧΓΥ Ι ντεονολ Χαχηε    : Ενοβλεδ    Χ8000ς–ΧΒΦΦΦΣηαδοω       : Δι σοβλεδ
Εξτεονολ Χαχηε         : Ενοβλεδ    ΧΧ000–ΧΦΦΦΦ              : Δι σοβλεδ
Θυι γκ Γοωεο Ον Σελφ Τεστ : Ενοβλεδ Δ0000–Δ3ΦΦΦ             : Δι σοβλεδ
Βοοτ Σεθυενγε          : Α. Χ       Δ4000–Δ7ΦΦΦ              : Δι σοβλεδ
Σωαπ Φλοππω Δοι τε     : Δι σοβλεδ  Δ8000–ΔΒΦΦΦ              : Δι σοβλεδ
Βοοτ Υπ Φλοππω Σεεκ    : Ενοβλεδ    ΔΧ000–ΔΦΦΦΦ              : Δι σοβλεδ
Βοοτ υπ Νυιλοψκ Στατυσ : Ον
Βοοτ Υπ Σιυστεμ Σπεεδ  : Ηι γη
Ι ΔΕ ΗΔΔ Βλογκ Νοδε    : Ενοβλεδ
Γατε Α20 Οπτι ον       : Νοουαλ
ΝευοοωΓαοι τω Χηεγκ    : Ενοβλεδ    ─────────────────────────────────
Τυπεματι γ Ρατε Σεττι νγ : Δι σοβλεδ
Τυπεματι γ Ρατε ( Χηαο/ Σεχ) : 6   ESC : Quit      ↑↓←→ :Select Item
Τυπεματι γ Δελαω( Νσεχ) : 250      F1  : Help
Σεχυρι τψ Οπτι ον      : Σετυπ      F5  : Old Values PU/PD/+/- :Modify
                                    F6  : Load BIOS Defaults
                                    F7  : Load Setup Defaults
```

BIOS features setup

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, if Virus Warning is enabled, the following error message will automatically appear:

```
                !WARNING!
       Disk boot sector is to be modified
 Type "Y" to accept write or "N" to abort write
             Award Software, Inc.
```

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 "A, C".

C,A	System will first search the hard drive, then the floppy drive.
A,C	System will first search the floppy drive, then the hard drive.

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.

Memory parity check

Enabled	Normal memory parity check. If system DRAM has no parity bit, the the system will display "RAM parity error".
Disabled	Ignores memory parity check even if DRAM has no parity bit. The the system will display "RAM parity error".

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 hit the <ENTER> key to disable security. When security is disabled, the system will boot, and you can enter Setup freely.

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

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-6144V.

```
              ROM PCI/ISA BIOS (2A4IBAK1)
                 CHIPSET FEATURES SETUP
                   AWARD SOFTWARE, INC.

Αυτο Χονφιγυρατιον    : Εναβλεδ   ΟνΒοαρδ 496Β ΙΔΕ Πορτ   : Βοτη
                                  ΙΔΕ0 Μαστερ Μοδε        : Αυτο
ΙΣΑ Βυσ Χλοχκ         : 1/4 ΓΧΛΚ  ΙΔΕ0 Σλαφε Μοδε         : Αυτο
ΛΒΔ# Σομπλε Τοιντ     : Ενδ οφ Τ2 ΙΔΕ1 Μαστερ Μοδε        : Αυτο
                                  ΙΔΕ1 Σλαφε Μοδε         : Αυτο
Χαχηε Σοιτε Χιυχλε    : 2 ΧΧΛΚ    ΙΔΕ Πρεφετχη Ρεαδ Βυφφερ: Δισαβλεδ
Χαχηε Βυρστ Ρεαδ Χιυχλε: 1 ΧΧΛΚ  ΙΔΕ ΗΔΔ Βλοχκ Μοδε      : Δισαβλεδ
Λ2 Χαχηε/ ΔΡΑΜΧψχλε ΩΣ : 2 ΧΧΛΚ
                                  ΟνΒοαρδ ΦΔΧ Χοντρολλερ  : Εναβλεδ
ΛΡΑΜΡΑΣ το ΧΑΣ Δελαψ  : 3 ΧΧΛΚ    ΟνΒοαρδ Σεριαλ Πορτ 1   : ΧΟΜ1
ΛΡΑΜΧοιτε Χιυχλε      : 1 ΩΣ      ΟνΒοαρδ Σεριαλ Πορτ 2   : ΧΟΜ2
ΛΡΑΜΧοιτε ΧΑΣ Πυλσε   : 2 ΧΧΛΚ    ΧΟΜ3 & ΧΟΜ4 Αδδρεσσ     : 338Η  238Η
ΛΡΑΜΧΑΣ Πρεχηαρνε Τιμε: 1 ΧΧΛΚ   ΟνΒοαρδ Παραλλελ Πορτ   : 278Η
ΛΡΑΜΡΑΣ το ΜΑ Δελαψ   : 1 ΧΧΛΚ    Παρολλελ Πορτ Μοδε      : Νορμαλ
ΛΡΑΜ Σπεεδ           : Φαστερ
ΔΡΑΜ Σλοω Ρεφρεση    : Δισαβλεδ
                                  ┌─────────────────────────────────┐
ΧΠΥ Βυρστ Χοιτε       : Δισαβλεδ  │ESC: Quit       ↑↓←→ : Select Item│
Λ2 Χαχηε Πολιχψ       : Γριτε Τηρυ│F1 : Help    PU/PD/+/-  : Modify  │
Λ2 Χαχηε Ταγ Βιτσ     : 8 βιτσ    │F5 : Old Values (Shift)F2 : Color │
                                  │F6 : Load BIOS Defaults           │
                                  └─────────────────────────────────┘
```

CHIPSET features setup

Note: If you enable the IDE HDD block mode, the enhanced IDE driver will be enabled.

Power management setup

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

```
                ROM PCI/ISA BIOS (2A4IBAK1)
                   POWER MANAGEMENT SETUP
                    AWARD SOFTWARE, INC.

Γοαεο Λαναγεμεντ  : Δι σαβλεδ    Ι Ρ64  ( ΧΜ1)        · Εναβλεδ
ΓΜΧοντοολ Βιι ΑΓΜ  : Ψεσ         Ι Ρ65  ( ΑΓΤ2)        · Εναβλεδ
ϲι δεο Ϲϕϕ Οπτι ον · Σιστ  Στβω--> Ϲϕϕ  Ι Ρ66  ( δ1οππψΔι σκ)  · Εναβλεδ
ϲι δεο Ϲϕϕ Νετποδ  : ϲ/ ΗΣΨΝΧ+Βλανκ    Ι Ρ67  ( ΑΓΤ 1)        · Εναβλεδ
Συσπενδ Σαι τχη    : Εναβλεδ     Ι Ρ68  ( ΡΤΧ Αλοσιι)  · Δι σαβλεδ
                                Ι Ρ69  ( Ι Ρ62 Ρεδι ρ)  · Εναβλεδ
        ** ΓΜΤι με οσ **        Ι Ρ610 ( Ρεσερ̄πεδ)   · Εναβλεδ
ΗΛΛ Ϲϕϕ Αϕτερ      : Δι σαβλεδ   Ι Ρ611 ( Ρεσερ̄πεδ)   · Εναβλεδ
Λοζε Νοδε          : Δι σαβλεδ   Ι Ρ612 ( ΡΣ/2 λουσε)   · Εναβλεδ
Στανδβιι Νοδε      · Δι σαβλεδ   Ι Ρ613 ( Χοπρονεσσορ)  · Εναβλεδ
Συσπενδ Νοδε       : Δι σαβλεδ   Ι Ρ614 ( Εσπδ δι σκ)   · Εναβλεδ
                                Ι Ρ615 ( Ρεσερ̄πεδ)   : Εναβλεδ
        ** ΓΜΕ̄εντσ **
ΓΧΙ Νασ̄τερ Αχτι σι τψ: Εναβλεδ
ΧΟΜ Γοοτσ Αχτι σι τω : Εναβλεδ
ΛΓΤ Γοοτσ Αχτι σι τω : Εναβλεδ   ESC: Quit        ↑↓←→ : Select Item
ΗΛΛ Γοοτσ Αχτι σι τψ : Εναβλεδ   F1 : Help     PU/PD/+/-  : Modify
ΛΝΑ Γοοτσ Αχτι σι τψ : Εναβλεδ   F5 : Old Values  (Shift)F2 : Color
ϲΓΑ Αχτι σι τω       · Δι σαβλεδ  F6 : Load BIOS Defaults
Ι Ρ63  ( ΧΟΜ2)      : Εναβλεδ   F7 : Load Setup Defaults
```

Power management

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

PM Control by APM
This option is only effective if APM (Advanced Power Management) is installed. If under APM control, system BIOS will wait for APM's prompt before entering any power management mode.

Note: If there is a task running, the APM will not prompt BIOS to activate any power saving mode.

Video Off Option
This option allows you to determine if the screen will always stay on, or turn off when in SUSPEND and/or STANDBY modes.

Video Off Method

This option controls to what degree will the video be downed:

1. Blank screen only turns off the screen

2. V/H SYNC + Blank will also turn off the V-SYNC and H-SYNC signals from the VGA cards to the monitor

3. DPMS is enabled only for VGA cards that support DPMS.

Suspend Switch

This enables or disables the External Suspend Switch.

PM Timers

The options under this category allow you to disable or set the duration of time that the system is inactive before entering the listed modes.

HDD Off After

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.

Doze Mode and Standby Mode

These modes will put the system into low speed or 8 MHz. Screen may turn off depending on the setting for Video Off method.

Suspend Mode

Suspend mode puts the system into low speed or 8 MHz, and the system clock is stopped. Screen may turn off depending on the setting for Video Off method.

Note: System Doze, Standby Doze, and System Suspend will be loaded with predefined values if the Power Management option is not set to "User defined".

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

PM Events

Each of the options in this category can be enabled or disabled. If a particular option is enabled, the activity of the specified event will cause the PM timers for Doze, Standby, and Suspend modes to reload. If disabled, the specified event will have no effect on the PM timers, and the prevailing power saving mode continues.

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).

Load setup defaults

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

Password setting

To change, confirm, or disable the password, choose the "PASSWORD SETTING" option form 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."

IDE HDD auto detection

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

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.

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.

SVGA Setup

The PCA-6144V features an on-board VGA interface. This chapter provides information about:

- SVGA installation
- Display utilities and drivers
- Software installation

SVGA driver installation

Installing from Windows

The graphic installation program (TINSTALL) supports a simple 6 step installation procedure for the display driver setup program, the power management program and the UNinstall program.

To use TINSTALL, follow the 6 steps below:

1. Ensure that MS Windows 3.1 is up and running properly, using the standard VGA driver.

2. Select the MAIN group in Program Manager.

3. Select RUN from the FILE menu on the menu bar.

5. Type in A:TINSTALL (if the display driver disk is in the B drive, type in B:TINSTALL instead), as shown below, and then press <ENTER>.

Run
Command Line:
A:TINSTALL
☐ Run **M**inimized

OK   Cancel   **B**rowse...   **H**elp
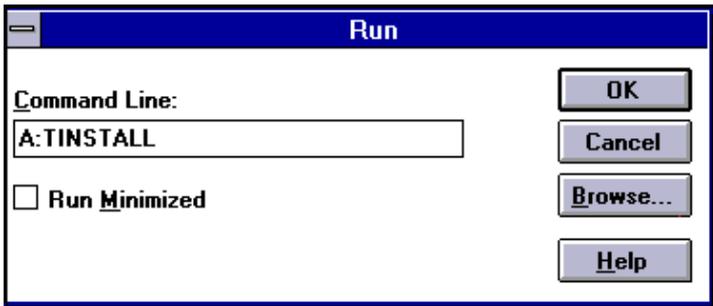
6. A menu will appear, presenting a choice of **Express** or **Custom Installation**.

Express Installation

Express Installation automatically copies the display drivers into the TRIDENT.AGI directory and the Utility files into the TRIDENT.UTL directory. Once all files are copied, a program group called DISPLAY DRIVER AND UTILITIES will be created.

Custom Installation

Custom Installation allows control over where files are stored and in what program group the icons are placed. The first dialog box that appears shows the default directory to which the display drivers will be copied.

To change the directory name:

1. Delete the default name.

2. Enter the desired directory name.

3. Once the desired directory name is selected, continue the installation procedure by selecting **Continue**, or by pressing <ENTER>.

The next dialog box displays a summary of where files are stored.

4. Select **Continue** to copy the drivers and utilities files.

When all files are copied, the program will present a choice of program groups where the icons will be created. Create a new group to place the utility icons or select from pre-existing groups (e.g. Main, Applications, Accessories, etc.).

Tinstall icons

The Tinstall program creates three icons:

a. Screen Control (Used to configure display drivers)

b. DPMS (Used for power management configurations)

c. UNinstall (Used to delete the installed TRIDENT drivers)

NOTE: Different "display driver set" versions cannot be installed to the same directory name.

"Display driver sets" of the same version number (e.g. UA6.0) will replace the existing one.

Screen Control

The Screen Control panel contains controls for setting screen resolution, color depth, font size, refresh rates. Not all combinations of screen resolution, color depth, font size and refresh rate are attainable.

Color depths of 16, 256, 64K, or 16.7M colors can be selected by clicking next to the desired option. Color depth determines the number of colors that may be simultaneously displayed on the screen. The selected color depth determines the possible resolutions.

Screen resolutions of 640x480, 800x600, 1024x768, 1280x1024, or 1600x1200 can be selected by clicking next to the available options. The virtual screen size is automatically adjusted to be at least as large as the selected screen resolution.

Available refresh rates are dependent on the selected color depth and resolution. The "Back to Default" option is used to reset the refresh rate to the factory default value.

To open Screen Control, double click on its icon. The following figure shows the Screen Control interface:

```
┌─────────────────────────────────────────────────────────────┐
│ ▬   Screen Control [AGi-UA6.1] - AGIDLV.DRV                  │
├─────────────────────────────────────────────────────────────┤
│ ┌─────────────────────────────────────────────────────────┐ │
│ │          You can change Refresh Rate right away.        │ │
│ └─────────────────────────────────────────────────────────┘ │
│ ┌─Color──────┐ ┌─Resolution───┐ ┌─Refresh Rate──────────┐  │
│ │ ○ 16       │ │ ○ 640x480    │ │ ○ 87Hz Int            │  │
│ │ ◉ 256 *    │ │ ○ 800x600    │ │ ◉ 60Hz                │  │
│ │ ○ 65K      │ │ ◉ 1024x768 * │ │ ○ 70Hz                │  │
│ │ ○ 16M      │ │ ○ 1280x1024  │ │ ○ 75Hz           [▲▼] │  │
│ │            │ │ ○ 1600x1200  │ │ [ Back to Default ]   │  │
│ └────────────┘ └──────────────┘ └───────────────────────┘  │
│ ☐ Use New Driver  ┌─Font──────────────────────────────────┐ │
│ [ Advanced ... ]  │ ○ Small   ◉ Large *   ○ Extra Large  │ │
│                   └───────────────────────────────────────┘ │
│                                                              │
│   [  OK  ]    [ Cancel ]    [ About ]    [ Help ]           │
└─────────────────────────────────────────────────────────────┘
```
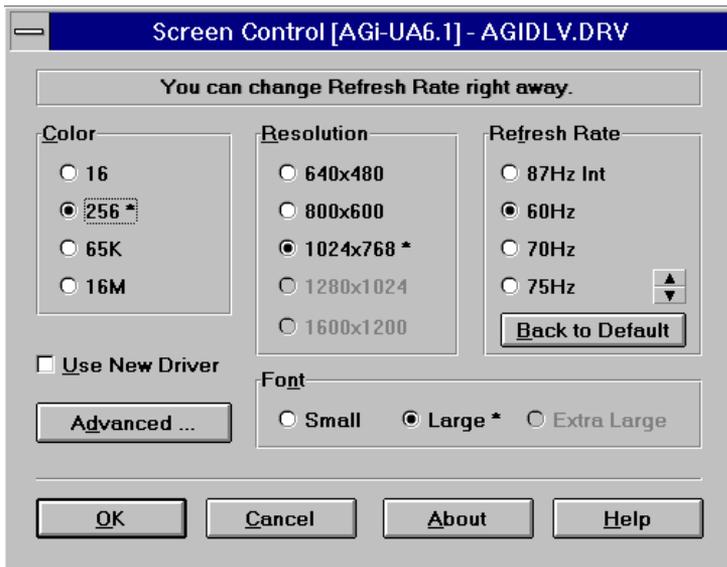
Configuring the Display Driver

1. Select the color depth first. If the current driver does not support the selected color depth, then Windows will have to be restarted.

2. Select the resolution.

3. Select the font size (if available as an option).

4. Select the refresh rate.

5. Click on OK. If the current driver does not support the selected configuration, Windows will have to be restarted.

Note: Hot Key Control should be enabled before going into advanced setup. There is no virtual screen support for 16 colors. 1280x1024 is only available for 16 colors.

Advanced features (Virtual Screen Control)

Virtual Screen Control
Standard display resolutions are 640x480, 800x600, 1024x768, 1280x1024. The amount of display memory used depends on the selected resolution and color depth. A substantial amount of display memory is left unused for lower resolutions. The Virtual Screen features take advantage of this unused memory by "expanding" the display area into the off-screen area.

Virtual Screen Control allows the user to make effective use of a display screen larger than the standard 640x480, 800x600 or 1024x768, and the standard resolution is the center of the screen. The user can "pan" around the larger Virtual Screen area by the use of a standard mouse or a set of "HOT KEYS." For example, it is possible to select a resolution of 640x480 and set the Virtual Screen size to 800 x 600. Thus, the 640 x 480 screen sits at the center of a 800 x 600 matrix, and the user can "pan" through the entire 800x600 matrix in a 640x480 window, as shown below.

Panning allows traversing a larger screen through a smaller window.
■ VIRTUAL SCREEN AREA   ■ ACTUAL DISPLAY AREA

The advanced features can be accessed by pressing <ALT> + D or by clicking on the **Advanced...** button on the Screen Control interface. This opens up an extension of the Main Panel that presents the following features:

1. **Hot Key** selection, which allows you to set up predefined key strokes for specific virtual screen related actions.

2. **Turn On** virtual screen, which allows the use of the predefined virtual screen sizes. The predefined virtual screen sizes are selected by clicking next to available options. The sizes of the available predefined virtual screens are dependent on the selected color depth and resolution.

3. **Customize** virtual screen area, which opens up a new screen titled Virtual Screen Advanced Settings:
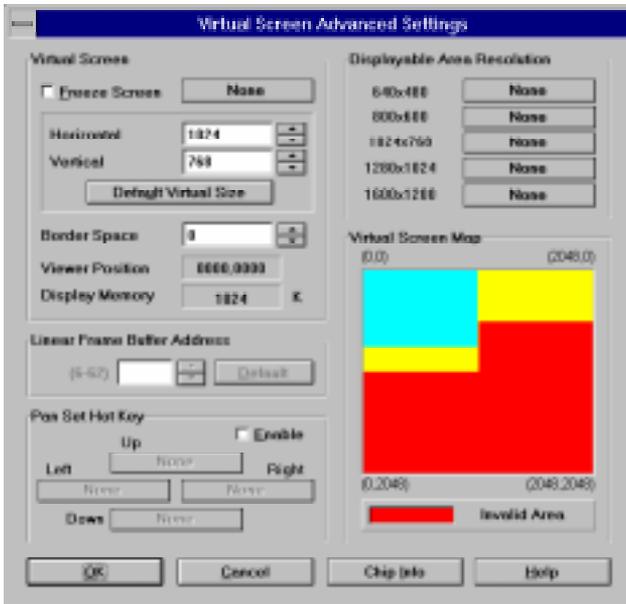
Virtual Screen Advanced Settings

- **Freeze Screen**: Disables the panning feature, giving the illusion of a frozen screen but keeping other virtual screen functions available. Hot key functions are available for this feature.

- **Linear Frame Buffer Address**: The Linear Addressing driver automatically detects the system's memory size and sets the frame buffer to an unused area above the system memory. The Linear Frame Buffer Address setting is useful in avoiding conflicts with Windows applications, which use the same linear frame buffer address as the Display Driver. Addresses between 18 and 63 MB can be selected. If there is no conflict, the default setting is highly recommended.

- **Border Space:** The Border Space option is used to set up a border (thickness measured in pixels) within the displayable area. The border is used as a marker for panning the screen, i.e. when the cursor hits against this border, screen panning occurs as shown below:
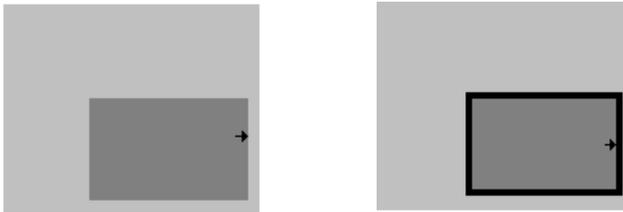
→ mouse cursor

■ border

- **Pan Set Hot Key:** Hot keys can be set up to pan the virtual screen left, right, up and down. The feature has to be enabled by clicking on the **Enable** box before hot keys can be selected.

Once all selections are made, click on **OK** or press <ALT> + O to exit the advanced setup.

DPMS (Display Power Management Signaling)

The POWER MANAGEMENT program is designed for energy-saving monitors that conform to the VESA Display Power Management Signaling (DPMS) standard.

WARNING: THE USE OF THIS PROGRAM IS NOT RE-COMMENDED FOR MONITORS THAT DO NOT SUPPORT THE VESA DPMS STANDARD.

The program offers three power-down modes:

1. Standby (minimum power savings)

2. Suspend (substantial power savings)

3. Off state (maximum power savings)
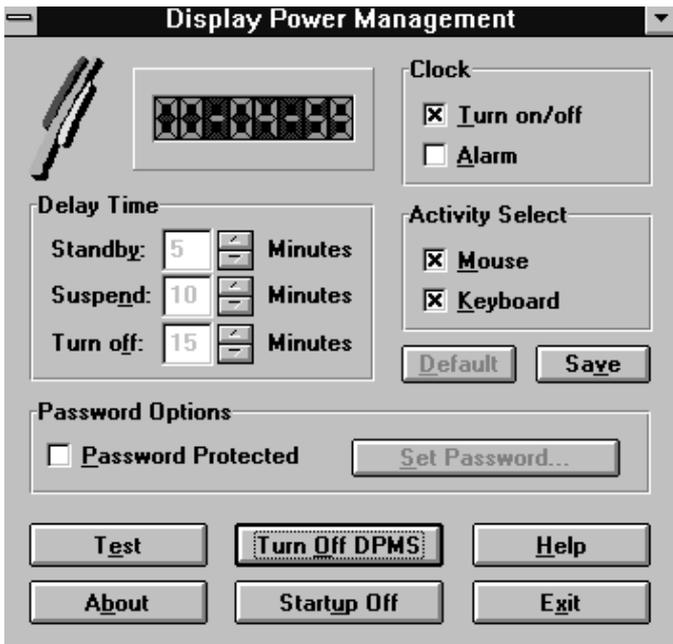
The program monitors for mouse and/or keyboard activity. When activity is not detected for a specified delay period (controlled by the Delay Time parameter), the program signals the TGUI9440AGi to enter the selected power-down modes.

The Display Power Management program offers several options to customize the DPMS operation.

Delay Time

The delay time to enter each mode can be set by entering the value (in minutes) in the Delay Time parameters. Values can be entered by either clicking on the count-up or count-down button, or by clicking on the number, deleting it, and typing in the desired time in minutes, as shown below.
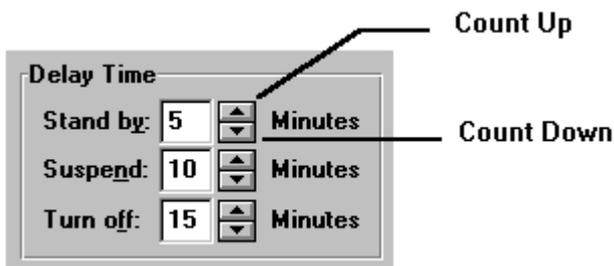
Activity Select

The Activity Select option selects which activity the program senses in order to restore the display to the monitor. For example, if both mouse and keyboard are selected, then either activity will re-establish the powered down signals.

Clock

Turning on the clock enables the digital count down display.

Alarm

If the Alarm option is enabled, then the last 5 seconds of count-down to Stand by mode is synchronized with beeps from the PC speaker.

Password Option

The Password Option sets up a password to get back onto the screen.

- A password is set up by first clicking on the box marked PASSWORD PROTECTED or by pressing <ALT> + P (this is confirmed by the presence of an "X" in the box).

- Press <ALT> + S or click on the box marked SET PASSWORD.

- Type in the selected password (twice) and select OK, or press <ENTER>.

Startup On/Off

This option installs the Display Power Management program onto the Windows Startup file, so that DPMS is active upon entering Windows.

Default

The default button sets all parameters back to the factory default values.

Test

The test feature is used to give a demonstration of the DPMS power down function.

Save

This feature is used to save all the current settings. Once all settings are selected, the program is activated by pressing <ALT> + O or by clicking on the box marked **Turn On DPMS**.

Display driver Uninstallation

The UNinstall program enables the user to safely delete specific display drivers or an entire display driver set.

To remove an entire Display Driver Set, complete the following steps:

1. Using the arrow keys or mouse, select the Display Driver Set that is to be removed (the set to be deleted should be highlighted).

2. Once the desired Driver Set is selected, simply select the **Delete** button or press <ENTER>.

NOTE: *The UNinstall program will not permit the deletion of a Display Driver set that is currently used.*

To remove an individual driver from a Display Driver Set, complete the following steps:

1. Using the arrow keys or mouse, select the Display Driver Set that is to be removed (the set to be deleted should be highlighted).

2. Once the desired Driver Set is selected, click on the **Enter** button. This will pull up a list of available display drivers.

3. Select the display driver to be deleted by using the mouse or the up/down arrow keys to scroll through the list.

4. Click on the **Delete** button or press <ALT> + D to delete the selected display driver.

Microsoft Windows NT

Installation

1. Run the Microsoft Windows NT Setup program located in the Main group of Program Manager.

2. Select **Change System Settings** from the Options pull-down menu.

3. Select **Other** from the display options.

4. Microsoft Windows NT 3.1 will prompt you for the correct path where the Trident drivers are located. Enter the path "**X:**\TVGAUTIL\NTDRV\NT31\" where **X** is the drive where Disk 2 of the Trident Utility and DOS Application drivers have been installed .

5. A list of all Trident drivers will appear. Select the resolution   and color depth desired.

6. Restart Microsoft Windows NT. The desired Trident driver will then be in effect.

NOTE: *If you select a color depth or resolution that is not supported by your card, NT will substitute 640x480 in 256 colors for the display.*

Microsoft Windows NT 3.5 Installation

1. Run the Microsoft Windows NT display Setup program located in the Control Panel of the Main group.

2. Select **Change Display Type...** button from the Display Settings options.

3. Select **Change...** button from the Display Type options.

4. Select **Other...** button from the Select Device options.

5. Microsoft Windows NT 3.1 will prompt you for the correct path where the Trident drivers are located. Enter the path "**X:**\TVGAUTIL\NTDRV\NT31\" where **X** is the drive where Disk 2 of the Trident Utility and DOS Application drivers have been installed.

6. A list of all Trident drivers will appear. Select the resolution and color depth desired.

7. Restart Microsoft Windows NT. The desired Trident driver will then be in effect.

NOTE: *If you select a color depth or resolution that is not supported by your card, NT will substitute 640x480 in 256 colors for the display.*

Utilities installation

The Utility Installation program is used to install and retrieve instructions on:

a) Utility programs.

b) Non-Windows applications display drivers.

The Utility installation program is run by executing the following steps:

1. Insert the UA 6.0 disk # 2 in the floppy drive.

2. Type in README at the floppy drive prompt.

3. A numbered list of available destination drives will be displayed on the screen. Select the destination drive by typing in the corresponding number, e.g. to select drive C, type in 1, as shown below.

```
 DRIVER/UTILITY for TVGA            Version UA6.0   7/15/94

 At least 2MB of hard disk space is required for installation.
   1. Drive C:,         2. Drive D:,         3. Drive E:

   Select a number ( 1, 2, 3 ) to continue:    (  ESC to Exit )
```

4. Files and subdirectories will be expanded into the newly created directory **TVGAUTIL**. A new menu will then be displayed on the screen, showing a list of on-line instructions:
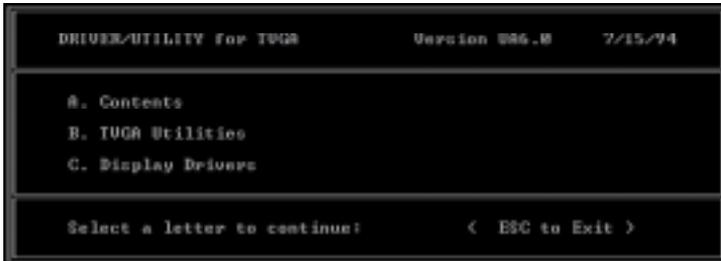
5. Selecting **A** will display the contents of all drivers in the list.
6. Selecting **B** will display instructions on the available utility programs.
7. Selecting **C** will display instructions on how to install display drivers for non-Windows applications.

Utilities summary

SVM. EXE
SVM is a menu-driven program designed to select and test all video modes available to the adapter.

How To Use SVM
The SVM program can be executed in either of two ways: by calling up the menu and selecting from the menu choices, or by entering the desired mode directly with a specific command line.

How To Use SVM From The Menu

1. Switch directory to "X:\TVGAUTIL\UTILITY" where **X** is the drive where Disk 2 of the Trident Utility and DOS Application drivers have been installed .

2. Type SVM to pull up the menu. You will see the following screen:

The top bar shows the available color depths. Move through the options with the right/left arrow keys.

The program provides all the different resolutions supported by the chip under each color depth. These resolutions are traversed by the up/down arrow keys.

The graphics adapter can be tested for each resolution/mode by first highlighting the selection by use of the arrow keys, then pressing the F5 key.

The graphics adapter can be run at a selected mode by first selecting

the mode, and then pressing <ENTER>.

How to Use SVM From The Command Line

The SVM program may be used to select a mode directly from the command line following two simple steps:

1. Switch directory to "X:\TVGAUTIL\UTILITY" where **X** is the drive where Disk 2 of the Trident Utility and DOS Application drivers have been installed.

2. Type in: SVM [mode number]ENTER.

For example, to run the graphics adapter in mode 62H, the command for item 2 above would be:

```
SVM 62 ENTER
```

SMONITOR

SMONITOR is designed to set the monitor group and the monitor type:

```
Usage: SMONITOR <GROUP|OPTION>
```

Set Monitor Group

The graphics extended modes set by the graphics card's BIOS are sorted into six groups categorized by the monitor's refresh rate. The group setting as below:

Resolution	Group							
	0	1	2	3	4	5	6	7
640X400	70	70	70	70	70	70	70	70
640x480	60	60	75	85	95	95	95	95
800x600	56	60	75	75	85	85	95	95
1024x768	87i	87i	60	70	75	85	95	95
1280x1024	87i	87i	87i	87i	60	60	60	60

1600x1200	87i	87i	87i	87i	87i	87i	87i	87i

OPTION:

    C   SET COLOR MONITOR

    M   SET MONOCHROME MONITOR

The default group number is 4.

If you want set the monitor group, type:

  `SMONITOR GROUP`

where GROUP is one of the group number listed above.

Set Monitor Color

Switches between color and monochrome display. Some monitors (most notably Samsung monitors manufactured before 2/8/91) do not adhere to the standard IBM pinout definitions, which causes the VGA card to boot up in monochrome instead of color. This utility may be used to correct the problem.

To set the monitor as color, type: `SMONITOR C`

or type: `SMONITOR M`

to set monochrome monitor.

TVGACRTC

The TVGACRTC program allows the adjustment of video display parameters so that images are optimally sized and centered on the screen. Adjustable parameters include:

• Horizontal size and position.

• Vertical size and position.

• Pixel frequency.

The program is started from the DOS prompt by typing in `TVGACRTC` from the C:\TVGAUTIL\UTILITY directory.

The first section of the program is used to define a given name for the adjustments to be made.

1. Press <ENTER> to add a new monitor entry and type in the name of the manufacturer, followed by <ENTER> keystroke. The program will allow any name to be typed in.

2. Type in the associated comments for the monitor settings and press <ENTER>.

3. A mode table will be displayed, presenting all the adjustable modes as shown below:

4. This table is traversed through the use of the up/down arrow keys. The mode highlighted is the selected mode for adjustment.

5. Select the mode to be adjusted and press <ENTER>.

6. Select the desired pixel rate by scrolling the list using the up/down arrow keys, followed by pressing <ENTER> twice.

7. The screen alignment test pattern will then be displayed. The up/down arrow keys are used to adjust the vertical positioning of the screen. The left/right arrow keys are used for horizontal alignment of the screen. The Home/End keys are used for horizontal screen sizing and the Page Up/Down keys are used for vertical screen sizing. Once the screen position and size is adjusted, press **<ENTER>**, followed by the <ESC> keystroke.

8. To save the settings, type Y and press <ENTER>. The program will then modify the **Config.sys** file.

9. At this point press <ESC> and reboot the system to enable the parameter changes.

Software drivers installation

After selecting Drivers from the Main Menu in Program Manager, you will be presented with a list of possible drivers to install. Select the driver(s) you wish to install. A version list will be given for the given application. Choose the appropriate version for the application. Once you have selected the driver, the installation program will provide you with further instructions. For details on installing each available driver, refer to the README.TEXT file on the provide Utiltiy disk.

The following is a list of drivers supported by the PCA-6144V.

- AutoCAD
- VersaCAD
- Lotus
- MS Word
- Symphony
- WordPerfect
- Quattro Pro

- Autoshade
- GEM Desktop
- MS Windows™
- OS/2 Presentation Manager
- Ventura
- SCO
- VESA BIOS Extension (for VESA standard SVGA drivers)

Programming the Watchdog Timer

The PCA-6144V 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

If you decide to program the watchdog timer, you must write a program which reads I/O port address 443 (hex) at regular intervals. The first time your program reads the port, it enables the watchdog timer. After that your program must read the port at time intervals less than 2.0 seconds (as set in the BIOS). Otherwise, the watchdog timer will activate and reset the CPU or generate an interrupt on IRQ11. When you want to disable the watchdog timer, your program should read I/O port 043 (hex).

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

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

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

B

Hardware Interrupt Information

Interrupt assignments

Priority	Interrupt#	Interrupt source
-	IRQ2	Interrupt from controller 2 (cascade)
1	NMI	Parity error detected
2	IRQ0	Interval timer, counter 0 output
3	IRQ1	Keyboard
4	IRQ8	Real-time clock
5	IRQ9	Reserved
6	IRQ10	Reserved
7	IRQ11	Watchdog IRQ
8	IRQ12	PS/2 mouse
9	IRQ13	INT from co-processor
10	IRQ14	IDE 0 driver
11	IRQ15	IDE 1 driver
12	IRQ3	Serial communication port 2
13	IRQ4	Serial communication port 1
14	IRQ5	Reserved
15	IRQ6	Diskette controller (FDC)
16	IRQ7	Parallel port 1 (print port)